EFFECTIVENESS OF TAILORED EXERCISE PROGRAM ON LEVELS OF PHYSICAL PERFORMANCE, MOBILITY AND FALLS EFFICACY AMONG ELDERLY IN POONGUDIL OLD AGE HOME, AT POOVANTHI

Reg No: 3016118552

A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

OCTOBER 2018

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External Examiner

CERTIFICATE

This is to certify that the dissertation entitled **"EFFECTIVENESS OF TAILORED EXERCISE PROGRAM ON LEVELS OF PHYSICAL PERFORMANCE, MOBILITY AND FALLS EFFICACY AMONG ELDERLY IN POONGUDIL OLD AGE HOME, AT POOVANTHI"** is submitted to the faculty of Nursing, **The Tamilnadu Dr. M. G. R. Medical University, Chennai**, by **Mrs.Jothimalar** M.Sc (N) II Year in partial fulfilment of the requirement for the degree of Master of Science in Nursing. It is the bonafide work done by her and the conclusions are her own. It is further certified that this dissertation (or) any past thereof has not formed the basis for award of any degree, diploma (or) any title.

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ABSTRACT

Effectiveness of tailored exercise program on levels of physical performance , mobility and falls efficacy among elderly in a old age home, Poovanthi was undertaken by Reg.No :301611852 during the year 2017-2018 in partial fulfilment of the requirement for the degree of Master of Science in Nursing at RASS Academy college of Nursing, Poovanthi. Which is affiliated to The Tamilnadu Dr.M.G.R. Medical University ,Chennai.

Objectives: To assess the level of physical performance, mobility and falls efficacy before tailored exercise program among elderly. To assess the effectiveness of tailored exercise program on level of physical performance, mobility and falls efficacy among elderly. To associate the pre test level of physical performance, mobility and falls efficacy and the selected demographic variables. **Conceptual framework:** The study was based on Ernestine Widenbach's helping art of clinical nursing theory. Review of related literature facilitated the investigator to collect information to support, to select the a problem, to design the methodology and to adopt the tool. **Design:** The investigator adopted pre experimental research design, one group pre test and post test design. **Setting:** The study was conducted in Poongudil old age home, Poovanthi. Pilot study was done on 6 patients and the tool was found to be feasible. **Sample size**: The sample size was 30. **Sampling technique:** The purposive sampling technique was used to select the elderly for the study. **Intervention:** the Tailored exercise programme (Flexibility, Balance and Strengthening exercise) was given. **Data collection procedure:** Falls efficacy scale, physical performance test and elderly mobility scale was used to assess the level of Falls efficacy, physical performance and elderly mobility among elderly residing in old age home, Poovanthi. **Conclusion:** Tailored exercise programme was effective on the level physical performance, mobility and falls efficacy among elderly residing in poongudil old age home, Poovanthi.

CHAPTER - I

INTRODUCTION

“Aging is not lost youth but a new stage of opportunity and strength.”

(Betty friedan)

Background of the study

“Human Being" has a definition of a man, woman, or child of the species *Homo sapiens*, distinguished from other animals by superior mental development, power of articulate speech, and upright stance. This is what a human being is **(Prateek Surya Prakash, 2015)**

The human life span can be split into a number of stages: infancy, childhood, adolescence, young adulthood, adulthood, and old age. The lengths of these stages, however, have varied across cultures and time periods. **(Wilson, E.O, 2002)**

Aging is defined as “the chronological process of growing physically older. However, there is also a social dimension in which chronology is less important than the meaning attached to the process. Different cultural values and social expectations apply according to gender and age group and therefore there are socially structured variations in the personal experience of aging” **(Jarry ,1995)**

"Getting old is not for sissies." No matter who we are — man, woman, rich or poor — we all grow old. But the pace and precise way it happens varies from person to person, depending on genetic and environmental factors. While someone’s genetic makeup plays a huge part in determining his life expectancy, the quality of health care received and a healthy lifestyle are significant contributors to longevity. Nonetheless, dealing with the aging process is a challenge, and when it begins, the impact is felt throughout the body — in the respiratory, cardiovascular, nervous, musculoskeletal, and immune systems. And while an individual can age and remain healthy, some ailments are directly linked to age-related change. Those conditions include: Vision changes/cataracts, Hearing loss, Arthritis, Sleep changes/disorders, Osteoporosis, Cardiovascular diseases and stroke, Diabetes, Cancer. **(Bette Davis, 2018).**

Physiological changes in elderly refers to the physical changes an Individual experiences because of the decline in the normal functioning of the body resulting in poor mobility, vision, hearing, inability to eat and digest food properly, a decline in memory, the inability to control certain physiological functions and various chronic health problems.

Unstable gait and falls are serious issues in elderly since they lead to injury, restricted activities, increased indoor admissions and even deaths. Risk factors for the repeated falls in elderly are poor muscle strength, cerebellum/basal ganglia involvement, hypoglycemia in diabetes and postural hypotension (mostly drug induced or autonomic) in hypertension and peripheral neuropathies. Preventive strategies for falls need comprehensive medical, rehabilitative and environmental interventions.

Falls, defined as an unintended event that results in change of the starting position of the individual to the same level or lower, are an important cause of mortality, morbidity, disability, and hospitalizations in the elderly population. A situation was observed within this population: women are the ones who fall the most; 30% fall at least once a year and, out of these, 50% fall very often. **(**Gianluca, Isabela, Marcos,2017) .

Fear of falling is a defined geriatric syndrome that may contribute to further functional decline in an already frail patient. When people experience something unpleasant, their natural response is an aversion to that experience. People may begin to limit their activities after a fall or as they become weaker and less agile with increasing age. This leads to a more sedentary lifestyle and physical atrophy, which further predisposes them to falls. **(Aimee ,Kuo-wei,Peter Khang, 2013)**

Fall-related injuries are more common among older persons and are a major cause of pain, disability, loss of independence and premature death. Injuries are the sixth leading cause of death in adults of 65 years of age or more and falls are the leading cause of such injuries. **(Waleed Al-Faisal,2006)**

Falls are a common, costly and preventable consequence of sensorimotor impairments that increase in prevalence with advancing age. A fall occurs when the physical ability of the individual is unable to match the immediate demands of the

environment and/or of the activity being undertaken. Targeted exercise aimed at improving the physical ability of the individual, such as balance and strength training, is crucial for promoting functional independence and mobility and reducing the risk of falling in older age. Exercise programs that provide a high challenge to balance, have a high dose, include progression of intensity over time and are ongoing are most effective for preventing falls.

Iindividually-tailored exercise programs that target known intrinsic risk factor also appear to be most effective for frail older adults who are advanced in age (> 80 years) and at high risk for falls (i.e., injury-related fall within past six months, presence of two or more risk factors associated with falls, including co-morbid conditions that are less medically stable). A health-care professional who can tailor the type of exercise to the specific needs and abilities of the individual generally supervises these types of programs. The initial focus in these types of exercise programs should be on strengthening all major muscle groups in a seated or supported standing position until sufficient strength permits the inclusion of unsupported standing exercises that emphasize dynamic balance and mobility. In addition to the improvements in physical capacity gained, these programs also positively impact the individual's perceived quality of life. For older adults at high risk for falls, physical activity serves a tertiary role by raising their physical capacity to a level that will allow for greater independence in the performance of essential activities of daily living (i.e., dressing, bathing, transfers) and require less assistance with more advanced activities of daily living (e.g., shopping, walking in the community, assorted household chores). **(Debra J. Rose,2002).**

This study provided guidance to older people regarding the safe and effective provision of programs aimed at improving strength and balance and preventing falls in older age.

Need for the study

People above the age of 60 years is fast growing, especially in India. India as the second most populous country in the world has 76.6 million people at or over the age of 60, constituting above 7.7% of total population. In the past three decades the older adult population (those 65 years of age and older) has grows twice as fast as the rest of the population. The number of older adults globally is expected to increase from

420 million in 2000 to 974 million in 2030. At present nearly 60%of older adults reside in the developing countries. In India, there has been a sharp increase in the number of elderly (60 years and older):6.4% of total population of 1.21 billion (2011 census). According to 2011 census, elderly (65 years and above) constitute 5.3% of total population (male 29,364,920 and Female 3,291,030). The likely number of elderly by 2016 will be around 113 million (10-112%of entire population), and it is projected that by the year 2050, the number of elderly would be about 324million.Falls are one of the major problems in the elderly and are considered one of the "Geriatric Giants". Recurrent falls are an important cause of morbidity and mortality in the elderly and are a marker of poor physical and cognitive status. .**(Lewis, 2015).**

Older people frequently fall. From 30 to 40 percent of community-dwelling adults older than 65 years fall each year. Rates are higher in nursing home resident and hospitalized patients. The incidence of falls rises steadily from middle age and peaks in persons older than 80 years. Between 20 and 30 percent of older adults who fall suffer serious injuries such as hip fractures and head trauma. The most prevalent fall-related injuries among older adults are fractures of the hip; spine; upper arm; forearm; and bones of the pelvis, hand, and ankle. Of these, the most serious injury is hip fracture, a leading cause of morbidity and excess mortality among older adults. During 1988-1996, the estimated number of hospital admissions for hip fracture increased from 230,000 to 340,000. In 1996, 80% of the admissions for hip fracture occurred among women (3). From 1988 to 1996, hip fracture hospitalization rates for women aged >65 years increased 23% Recovery from falls often is complicated by poor quality of life caused by restricted mobility, functional decline, and increased risk for nursing home.(Waleed Al-Faisal,2006)

A recent study, published in the Journal of the American Geriatrics Society (2011), reveals that the causes for falls, intrinsic causes for falls were more prevalent in people >70 years. The medical conditions causing falls, musculoskeletal causes and visual defect were common. Multiple aetiologies were present in many individuals. The incidence of falls increases with advancing age. It is one of the leading causes of death in elderly due to its complications of which 50% is hip fracture. The morbidity due to falls include 12 serious injuries and fractures, restricted mobility and loss of independence leading to functional decline, psychological fear of falling (post fall syndrome) and permanent disability. More than 90% of hip fractures

are associated with falls in persons above 70 years of age and is associated with greater mortality.

In a Multi-centric Community Study, evaluating Health Problems in the Elderly (Year 2010), in 10 states across India, covering a total population of 10,200 elderly with equal rural and urban distribution, the incidence of falls (History of a single fall in the last 6 months) was found to be 14% (Data to be published).Among the 35 states and union territories in India, Kerala has registered the highest proportion of elderly. The aged in Kerala constitute 11% of the population. Between 30 years, there has been 160% increase in the population of older adults, the majority of them being women. Their population, which was 9% , is expected to increase to 37% by 2051.The Kerala Aging Survey (KAS), conducted among more than 5,000 elderly (2,271 men and 2,722 women) in 14 districts of Kerala, was the keystone of the study. The results of the survey have shown that the age of participants ranged 5 from 60 to over 100 years of age with 54% being women. The results of the study show that falls and fractures are a significant issue among older adults**. (Usha.G , Krishnaswamy.B 2011)**

Joshi, Rajesh Kumar and Avasthi (2011) conducted a cross-sectional survey of 200 subjects over 60 years old (100 each from the urban population of Chandigarh City and the rural population of Haryana State of India) was carried out using a cluster sampling technique. Various socio-demographic characteristics were recorded at baseline. A clinical diagnosis was made by a physician based on reported illness, clinical examination, and cross-checking of medical records and medications held by the subjects. Psychological distress and disability was assessed using the PGI Health Questionnaire-N-1 and the Rapid Disability Rating Scale-2, respectively. Assessment of the morbidity profile and its determinants will help in the application of interventions, both medical and social, to improve the health status and thus the quality of life of the elderly in Northern India. The distribution of history of fall among elderly people over 60 years old shows that, out of the total sample population, 103 (51.5%) subjects had fallen. Fracture was reported in 21.3%, and other injuries occurred in 79.6% of those who had fallen. Fractures among females (26.4%) were reported more frequently compared with males (16%) and fracture was seen more in urban subjects (29.4%) compared with rural subjects (13.4%).

Muscle weakness is a common impairment in older adults, it therefore is not surprising that these conditions frequently co-exist in the elderly. Skeletal muscles produce all voluntary human movement. Changes in properties and performance of muscles can profound affect an older person's ability to walk and function independently. Loss of muscle strength might be particularly problematic for an older person with who has pain, stiffness and mechanical changes to their joint that complicate their ability to mobility and make them particularly vulnerable to small changes in their physical status. Strength training has been the focus of a great deal of recent clinical research in many populations, including older adults. While the benefits of strength training have been well explored in reviews focused on both populations, there has been little attention paid to the benefits and risks of strength training when undertaken by old people. There is also evidence that strength training improves mobility (i.e. increased gait speed), simple functional tasks (i.e. standing up from a chair) and self- rating daily function in older adults.

As the population ages, the problems related to falls and fractures are expected to grow. Meeting these challenges requires a clear understanding of the prevalence and nature of falls, innovative planning to develop prevention programmes, systems and structures which will support falls prevention initiatives, and substantial reforms and policies at the local and national levels. In many developing countries including India, Fall events resulting in fractures is not recognised as a preventable risk factor. Responding to the caution of world experts and addressing the issue will avert the burden of fall related fractures. Several promising strategies such as exercise programmes, environmental modification, and other educational opportunities for preventing falls and fractures exist.

The U.S. Preventive Services Task Force (USPSTF) recommends older patients on measures to reduce the risk of falling. These measures include exercise (particularly training to improve balance), safety-related skills and behaviors, environmental hazard reduction, and monitoring and adjusting medications. This recommendation is based on fair evidence that these measures reduce the likelihood of falling. The USPSTF also recommends an intensive individualized home-based multi-factorial intervention for high-risk older patients in settings where adequate resources are available to deliver such services. Several studies have examined single

risk-factor modification and multi-factorial interventions, and have found that both can prevent falls in older patients . (Waleed Al-Faisal,2006)

Physical activities that stimulate the multiple dimensions of balance should be the foundation of any structured exercise program aimed at reducing fall risk. Activities designed to improve the older adults' ability to process and integrate sensory information, anticipate and/or react quickly and efficiently to changes in task demands and/or the environment, allocate attention appropriately, and perform multi-directional and segmental coordination activities in a controlled manner will be particularly important components of such a program25, 26. Including whole body functional activities that focus on improving muscular endurance, strength, and power, particularly in the muscle groups that contribute to postural alignment and stability during gait (e.g., ankle, knee, hip, and trunk) are also important for maintaining a high level of physical function. (Debra J. Rose, 2002).

Investigator has observed several patient verbalize their fear of falls, and inability in physical performance and mobility level in her personal experience. Hence, the nvestigator felt the need for Exercise program for Elderly people. As the investigator inspired by review of several studies, she was motivated to conduct the study on effectiveness of tailored exercise program on improvement in the level of physical performance, mobility and reduce the level of falls efficacy among elderly people.

Statement of the problem

Effectiveness of tailored exercise program on levels of physical performance, mobility and falls efficacy among elderly in poongudil old age home, Poovanthi.

Objectives:

- To assess the level of physical performance, mobility and falls efficacy before tailored exercise program among elderly.
- To evaluate the effectiveness of tailored exercise program on the level of physical performance, mobility and falls efficacy among elderly.
- To associate the pre test level of physical performance, mobility and falls efficacy and the selected demographic variables.

Hypothesis

H1: There is a significant difference in levels of physical performance, mobility and falls efficacy before and after tailored exercise program.

H2: There is a significant association between pre test level of physical performance, mobility and falls efficacy and the selected demographic variables.

Operational definitions:

Effectiveness:

The significant difference in the levels of physical performance, mobility and falls efficacy before and after tailored exercise program.

Tailored Exercise Program:

Individually tailored exercise is define as **home based, strength and balance retaining programme,** where resistance to lower limb muscles was provided via ankle cuff weights and the programme was carried out at leastthree times per week in 30 minutes.

Flexibility exercise:

Flexibility is the range of motion in the joints and the ability of joints to move freely.

Balance exercise:

Balance exercises can help to maintain the balance and confidence of important to prevent falls and maintain the independence.

Strengthening exercise:

Strength exercise is a type of physical exercise specializing in the use of resistance to induce muscular contraction which builds the strength, anaerobic endurance, and size of skeletal muscles.

Physical performance:

It refers to the ability to perform a physical task in day today activities assessed before and after the intervention measured by Brown's Modified Physical Performance Scale.

Mobility:

It refers to the capability to move in ones environment with ease and without restriction and walking aids which is measured by Smith's Elderly Mobility Scale.

Falls efficacy:

It refers to the beneficial change of elderly about their possibility of preventing fall as measured by Tinette's falls efficacy scale.

Elderly:

It refers to the persons who are aged 60 and above.

Old age home:

It refers to the place where elderly people are assisted care and supervised.

Delimitation:

The study is limited to Elderly who are,

- Aged 60 and above
- Residing at Poongudil old age home

Projected outcomes:

The study will reveal the importance of given tailored exercises on the level of physical performance, mobility and falls efficacy .

Conceptual Framework

Based on Wieden baches helping art of Clinical Nursing Theory. This section deals with the conceptual framework adopted for the study. A conceptual framework or model provides the investigator the guidelines to proceed in attaining the

objectives of the study. Based on the theory, it's schematic representation of the steps, activities and outcome of the study.

The conceptual framework of this study was based on Wiedenbach's helping art of clinical nursing theory. Ernestine wiedenbach's views this theory as a set of interrelated concepts that gives systematic view of a phenomenon that is explanatory and predictive in nature. The present study was aimed to help the tailored exercise programme. According to the theorists the practice of nursing comprises a wide variety of services each directed towards the attainment of one of its components.

STEP 1-IDENTIFYING THE NEED FOR HELP:

In identifying the need, the nurse perceives the patient as consistent or inconsistent, collect the information and identifying the need for help. There are two components in identifying the need for help.

a) General information

This comprises of collecting the information to identify the need. In this study the investigator assessed the general information which includes the demographic variables, level of physical performance, level of mobility, and level of falls efficacy among elderly living in old age home.

b) The central purpose

It refers to what the investigator wants to accomplish. Here the central purpose are to improve the level of physical performance, level of mobility and reduce the level of falls efficacy among elderly.

STEP 2- MINISTERING THE NEED FOR HELP.

Realities : It refers to physical, physiological, emotional and spiritual factors that come in play with situation involving the nursing action. Wiedenbach's defines the five realistic which include:

a) Agent:

The person who is providing care to elderly characterized personal attributes, proficiency, commitments and competence providing nursing action.

b) Recipient:

The recipient is the one who receives nursing action. In the present study the recipients are the elderly residing in old age homes.

c) Goal:

The goal is the nurse's desired outcome it is similar to the central purpose which is to improve the level of physical performance, mobililty and reduce the level of falls efficacy.

d) Means:

They are the activities through which the investigator aims the goal. It includes skill, techniques, procedures and devices that may be used to facilitate nursing practice. Here it refers to the exercise that is done by the elderly in the presence of the researcher.

e) Framework:

It refers to the facilities in which is practice. The frame work in this study has been considered as old age home, Poovanthi in which the study has been conducted.

Reassessment - If there was no improvement in the level of physical performance, mobility and reduce the level of falls efficacy the investigator recommended the reassessment.

Enhancement - If there was improvement in the level of physical performance, mobility and reduce the level of falls efficacy, enhancement of the intervention will be carried out.

STEP 3-VALIDATING THE NEED HELP WAS MET.

It is validating the needed help was delivered in achieving the central purpose. To collection of evidence that shows the needs have been met as a direct result of an action. This step involves the post assessment done after group exercise and comparison analysis to infer the outcome. This approach there by enables the investigator to make suitable decisions and take recommended action to continue or modify the nursing action. Here it is the comparison of pre and post test of the intervention level of tailored exercise program on physical performance , mobility and falls efficacy.

Conceptual framework figure

CHAPTER – II

REVIEW OF LITERATURE

The extensive review was made to strengthen the prevent study in order to lay down the foundation which help us to reveal the prevailing situation of the similar studies in different areas. The related literature of this study was presented in the following sessions.

1. Literature related to the level of physical performance among elderly.
2. Literature related to the level of mobility among elderly.
3. Literature related to the level of fall efficacy among elderly.
4. Literature related to other therapeutic exercises to improve the physical performance, mobility and falls efficacy among elderly.
5. Literature related to tailored exercise programme on the level of physical performance, mobility and falls efficacy among the elderly.

Literature related to the level of physical performance among elder

Nicola Veronese et. al., (2016) conducted study to assess the comparison of objective physical performance tests and future mortality in the elderly people. Among 3,099 odler community-dwelling participants included in the progetto Veneto anziani study,2,096 were followed for a mean of 4.4years. physical performance tests measured were short physical performance battery(SPPB),4-meter gait speed, chair stands time, leg extension and flexion, handgrip strength, and 6-minutes walking (6MWT), outcome was mortality assessed with death certificates. Participants who died during the follow-up (n=327) scored significantly worse in all physical performance tests measured at baseline than those who survived (n=1,769). Using a Harrell's C-index, the highest C-index was observed for 6MWT in men (C-index=0.735;95%confidence interval :0.701-0.770, p< .0001) and SPPB in women (C-index =0.781;95% CI:0.740-0.822, p=.0009).

Big Ja Jeoung et. al., (2015) conducted study to examine the relationship between frailty and physical performance in elderly women. One hundred fourteen elderly women participated in this study, their aged was from 65 to 80. We were

measured 6- min walk test, grip –strength, 30-sec chair stand test, 8 foot Up-and Go, back scratch, chair sit and reach, unipedal stance, BMI and the frailty with questionnaire. The collected data were analyzed by descriptive statistics, frequencies, correlation analysis, ANOVA, and simple liner regression using the IBM 21. SPSS program. In results, statistic tests showed that there were significant differences between frailty and 6-min walk test, 30-sec arm curl test , 30-sec chair stand test, grip-strength, back scratch, and BMI.

Rob C. Van Lummel et. al., (2015) conducted study to assess the associating between physical performance and physical activity in older adult: associated but separate domains of physical function in old age. In 49 older participants (83+7years; M+SD), performance based tests were conducted and physical activity was measured for one week. Activity monitor data were reduced in terms of duration, periods, and mean duration of periods of lying, sitting, standing and locomotion. The relation between and within physical performance scores and physical activity outcomes were analysed using rank order correlation and factor analysis. Factor structure after varimax rotation revealed two orthogonal factors explaining 78%of the variance in their data; one comprising all physical activity variables and one comprising all physical performance variables. Physical performance scores correlated moderately with physical activity in daily life.

Literature related to level of mobility among the elderly:

Shirley musich et. al., (2018) conducted study to assess an older adult population for subsequent interventions based on functional ability, and to estimate prevalence, characteristics and impact of mobility limitations on health outcomes. In 2016, surveys were sent to a stratified random sample of AARP® Medicare Supplement. Mobility limitations were defined using two screening questions. Responses were stratified to three mobility limitation levels. Multivariate regression models determined characteristics and impact on health outcomes. Among weighted survey respondents (N = 15,989), severe, moderate and no limitation levels were 21.4%, 18.4% and 60.3%, respectively. The strongest predictors of increased limitations included pain and poor health. Individuals with more severe limitations had increased falls, decreased preventive services compliance and increased healthcare utilization and expenditures. Utilizing two

screening questions stratified this population to three meaningful mobility limitation levels. Higher levels of mobility limitations were strongly associated with negative health outcomes. Mobility-enhancing interventions could promote successful aging.

Ashari Asmidawati, et. al., (2014) conducted study to improve turning and mobility performance among community dwelling older adults. Study participants will be aged 50 years and above, living in the community and have been identified as having impaired turning ability [outside of age and gender normal limits on the Step Quick Turn (180 degree turn) task on the Neurocom® Balance Master with long plate]. After a comprehensive baseline assessment, those classified as having balance impairment while turning will be randomized to intervention or control group. The intervention group will receive a 16 week individualized balance and strength home exercise program, based on the Otago Exercise Program with additional exercises focused on improving turning ability. Intervention group will attend four visit to the assessment centre over 16 weeks period, for provision, monitoring, modification of the exercise and encourage ongoing participation. Participants in the control group will continue with their usual activities. All participants will be re-assessed on completion of the 16 week program. Primary outcome measures will be the Step Quick Turn Test and Timed-Up and Go test. Secondary outcomes will include other clinical measures of balance, psychological aspects of falls, incidence of falls and falls risk factors.Results of this study will provide useful information for clinicians on the types of exercises to improve turning ability in older people with increased falls risk and the effectiveness of these exercises in improving outcomes.

Eylem Tutun Yumin et. al., (2011)conducted study to examine the effect of functional mobility and balance on health- related quality of life(HRQoL) among people living at home and those living in nursing home. The study included 122 elderly people aged 65 and over. With regard to the individuals whose socio-demographic data were collected in the scope of the study, balance and functional mobility levels were evaluated using the timed up and go test (TUG) and berg balance scale (BBS): HRQoL was evaluated using the Nottingham health profile (NHP); physical independence in daily activities was evaluated using the Barthel index(BI); and basic mobility in daily life was evaluated using the rivemead mobility index (RMI). Statistically significant differences were found between the TUG, BBS and NHP values of the elderly people living in a home environment and those living

in nursing homes ($p < 0.05$). However, no statistically significant difference could be found between the BI and RMI values ($p > 0.05$). A statistically significant relationship was found between the NHP and TUG, RMI BIand the use of assistive devices in daily life activities ($p < 0.05$).

Literature related to level of falls efficacy among elderly:

Kim Delbaere, et. al., (2010) conducted study to identify the determinants of disparitites between perceived and physiological risk of falling among elderly people Classification tree analysis was used to split the sample into four groups (vigorous, anxious, stoic, and aware)based on the disparity between physiological fall risk in the vigorous (144(29%)) and aware (202(40%))group. The anxious group (54(11%)) had a low physiological risk but high perceived fall risk, which was related to depressive symptoms($p =0.029$), neurotic personality traits ($p = 0.026$, and decreased executive functioning ($p =0.010$). the stoic group (100(20%)) had a high physiological risk but low perceived fall risk, which was protective for falling and mediated through a positive outlook of life($p =0.001$)and maintained physical activity and community participation($p= 0.048$).

Aniket sirohi (2017) conducted study to determine the prevalence of falls among elderly persons in a rural area and to study the association of falls with socio demographic variables and selected health conditions among 456 elderly persons in a rural area of Haryana falls, information regarding socio demographic details, selected health conditions, and history of falls in the past 12 months was recorded. Univariate analysis followed by stepwise multivariate logistic regression analysis was carried out. The effect of socio demographic and various health conditions on falls was analyzed using logistic regression analysis. Among the 456 study participants, the prevalence of falls in the past 12 months was 36.6% (95% confidence interval [CI] =32.1–40.0). The prevalence among women was 40.6% (95% CI = 34.5–46.7) and among men was 31.5% (95% CI = 25.0–37.9). Low socioeconomic status, urgency of micturition, knee pain, visual impairment, hearing impairment, functional disability, and depression were significantly associated with falls.

Aisling M.O.Halloran (2011) Conducted study to investigate the performance and variability is associated with falls and falls efficacy in older

adults.458 community-dwelling adults aged ≥ 60 years underwent a comprehensive geriatric assessment. Mean and variability of reaction time (RT), commission errors and omission errors were recorded during a fixed version of the Sustained Attention to Response Task (SART). RT variability was decomposed using the Fast Fourier Transform (FFT) procedure, to help characterise variability associated with the arousal and vigilance aspects of sustained attention. The number of self-reported falls in the previous twelve months, and falls efficacy (Modified Falls Efficacy Scale) were also recorded. Significant increases in the mean and variability of reaction time on the SART were significantly associated with both falls ($p < 0.01$) and reduced falls efficacy ($p < 0.05$) in older adults. An increase in omission errors was also associated with falls ($p < 0.01$) and reduced falls efficacy ($p < 0.05$). Upon controlling for age and gender affects, logistic regression modelling revealed that increasing variability associated with the vigilance (top-down) aspect of sustained attention was a retrospective predictor of falling ($p < 0.01$, OR = 1.14, 95% CI: 1.03 - 1.26) in the previous year and was weakly correlated with reduced falls efficacy in non-fallers ($p = 0.07$).

Literature related to other therapeutic exercise among elderly:

Shuhei Yamamoto et. al., (2016) conducted study to assess the effects of resistance training on muscle strength , exercise capacity, and mobility in middle – aged and elderly patients with coronary artery disease: A meta-analysis. Twenty – two trials totalling 1095 participants were analyzed. Performed random-effects meta- analysis. In middle –aged participants, RT increased lower extremity muscle strength (standardized mean difference (SMD): 0.65, 95%confidence interval (CI):0.35to 0.95), upper extremity muscle strength (SMD: 0.73,95%CI:0.48 to 0.99) and peak oxygen consumption(VO2)(weight mean difference (WMD):0.92Ml/kg /min, 95%CI:0.12 to 1.72), but did not improve mobility compared with the control. In elderly participants, RT increased lower extremity muscle strength (SMD: 0.63, 95%CI: 0.56 to 1.80), and improved mobility (SMD: 0,61, 95% CI: 0.21 to 1.01) compared with the control.

Lygia P.Lustosa et. al., (2011) conducted study to assess the impact of resistance exercise program on functional capacity and muscular strength of knee extensor in pre frail community-dwelling older women Frailty syndrome in elderly

people is characterized by a reduction of energy reserves and also by a decreased of resistance to stressors, resulting in an increase of vulnerability. Thirty-two pre-frail community –dwelling women participated in this study. Potential participants with cognitive impairment (MEEM), over extremities orthopaedic surgery, fractures, inability to walk unaided, neurological disease, acute inflammatory diseases, tumour growth, regular physical activity and current use of immune modulators were excluded. All participants were evaluated by a blinded assessor using: timed up and go (TUG),10-meter walk test (10MWT)and knee extensor muscle strength .the intervention consisted of strengthening exercise of the lower extremities at 70% of 1RM, three times/week for ten weeks. The statistical analysis was performed using the ANOVA and spearman tests. After the intervention, it was observed statistical significance on the work at 180/s (F=12.71, p =0.02), on the power at 180/s (F= 15.40, P=0.02) and on the functional capacity (TUG, F=9.54,p=0.01:TC10, F=3.80, p=0,01). There was a good negative anf statistically significant correlation between the TUG and work at 60/s, such as the TUG and work at 180/s (r=0.65, p=0.01;r=0.72,p=0.01) .

Hee Lee.sang-young et. al., (2014) conducted study to investigate whether lower limb strengthening exercise leads to improved lower limb strength and balance function for the elderly. Aging is associated with a progressive decline in overall muscle strength. Loss of lower limb strength leads to an increased risk of falls and a sedentary lifestyle. The purpose of this study was to investigate whether lower limb strengthening exercise leads to improved lower limb strength and balance function for the elderly. From a total of 74 respondents, 50 subjects were randomly assigned to either a training group (n = 30) or a control group (n = 20). The subjects ranged in age from 65 to 82 years. A randomized controlled trial compared the effects of strengthening exercise and balance function. Leg extension and lower curl exercises were performed during the 12-week study. After training, the lower limb strength and balance of the individuals in the training group had significantly improved compared to the baseline limb strength may lead to balance enhancement in neurologically intact older persons.

Minoru Yamada et. al., (2011) conducted study to assess the resistance training on physical performance and fear of falling in elderly with different levels of physical well-being. aged ≥ 65 years, community dwelling, has visited a primary

care physician within the previous 3 years, score of ≥8 by Rapid Dementia Screening Test , able to walk independently, willing to participate in group exercise classes for at least 6 months, We designed the effect size of the current study to be 0.4. With a significance level of 0.05, a power of 80%, and a moderate effect size (0.4), a minimum of 100 participants were needed in both the intervention and control groups. Accounting for a potential 20% attrition rate, a total of 240 participants were recruited for this study, which was deemed large enough to detect statistically significant differences. We analysed the effects of resistance training on all outcome measures using a mixed 2 (group: robust and frail groups) × 2 (time: pre-intervention, post-intervention) ANOVA. A 0.05 type 1 error rate was chosen *a priori* to indicate statistical significance. A *post hoc* paired *t*-test for within-group comparisons was performed to compare each dependent variable. The Bonferroni procedure was used to adjust the type 1 error rate of each analysis to 0.025 (0.05/2) as an indication of statistical significance to guarantee an overall type 1 error rate of 0.05. Data were entered and analysed using the Statistical Package for Social Science (Windows version 18.0). We screened 412 elderly and enrolled 337 (81.8%) who met the inclusion criteria for the trial and agreed to participate (Figure 1A). Most of the elderly who did not meet the inclusion criteria (n = 66) were excluded because they had exercised regularly for 6 months prior to the screening. Nine people who might have been eligible for the study declined after telephone screening. Of the 337 individuals who were enrolled in this study, 307 (91.1%) completed the 12-month intervention along with the second interview and the tests at the end of the study. Among them 148 in the robust group (93%) and 159 in the frail group (89%) completed the study.

Literature related to tailored exercise programme on the level of physical performance, mobility and falls efficacy among the elderly:

Patricia Inacio (2018) conducted study to assess the effectiveness of tailored exercise to improve daily living of early stage of amyotrophic lateral sclerosis The study enrolled 21 patients diagnosed with early-stage disease recruited at clinical facilities throughout Japan who underwent tailored but unsupervised home-based exercises. The group was called Home-EX exercises included in the program targeted upper limbs, lower limbs, and trunk muscles, along with functional training for activities of daily living such as turning over and standing from a chair. Patients

performed the exercises on their own over a six-month period and recorded each exercise type, frequency, and number of repetitions .Physical therapists regularly assessed the patients' reports and evaluated their muscle weakness via manual muscle testing (MMT). They also monitored patient fatigue each month during a face-to-face interview and readjusted the exercise program anytime there was a marked increase in fatigue or a decline in muscle strength. The study also included data from 84 patients with ALS (matching the characteristics of the Home-Ex patients) who underwent supervised exercise with a physical therapist for six months. These were the controls. Researchers assessed patients' Home-Ex outcomes using the ALS Functional Rating Scale-Revised (ALSFRS-R), which ranges from a score of 0 to 48. Higher scores indicate better function. A total of 15 patients out of 21 completed the six-month study period of home-based exercises. The results showed that patients in the Home-EX group had significant improvements in the total score of ALSFRS-R compared to controls – 38.1 vs. 33.1, respectively. The improvements were significant for the sub-parameter related to respiratory function, with Home-Ex patients scoring 11.8, compared to 10.5 in the control group.

Angelin Persis et. al., (2017) conducted study effectiveness of tailored exercise program on level of physical performance, mobility, falls efficacy among elderly. A pre experimental study with one group pre and tailored exercise program on level of physical performance, mobility and post test design using purposive sampling technique was adopted to select 30 elderly old age home, Vellore. Brown's physical performance scale, Smith's elderly mobility scale and tinette's falls efficacy scale were used. Tailored exercise (balance, strengthening and flexibility) were given thrice a week for a period of 5weeks. The paired "t" value of physical performance (3.3) was greater than the table value (2.76) which was statistically significant at $p < 0.01$ level. The paired "t" value of mobility (5.3) was greater than the table value (3.66) which was statistically significant at $p < 0.001$ level. The paired "t" vale of falls efficacy (12.7) was greater than the table value (3.66) which was statistically significant at $p < 0.001$ level proving effectiveness of tailored exercise program on physical performance, mobility and falls efficacy. The 'Chi' square value of demographic variable of physical performance (history of falls, elderly mobility (history of falls, period of falls) falls efficacy (BMI, education, co-morbid illness) were significant at $p < 0.05$ level.

Deepti Wadhwa, et. al., (2016) conducted study effectiveness of otago exercise program on reducing the fall in elderly: single case report. To find out the effectiveness of Otago exercise on reducing the fall risk in elderly Single case study Out Patient Department and at home A single individual with fall risk participated in this study Interventions used in this study included Otago Exercise Program which included strengthening exercise, balance re-training and walking. The interventions were given for 8 weeks. The outcome measures were 30 Second Chair Stand Test, Four-Stage Balance Test, Timed Up and Go test and Berg Balance Scale. The outcome measures were taken on first day, last day of 4th week and 8th week. The scores of 30 Second Chair Stand Test, Four-Stage Balance Test, Timed Up and Go test and Berg Balance Scale were improved.

Fung kam fris lee et. al., (2016) conducted study to assess the effectiveness of a tailor-made exercise adherence and health outcomes in patients with knee osteoarthritis. The intervention of this study was a 4-week community-based group exercise program, which required the participants to attend a 1-hour session each week. Thirty-four older people with knee OA were recruited to the program. Mixed-methods study design was used to estimate the effects of this program and explore the participants' perception and experience of the program. Exercise adherence and performance in return-demonstration of the exercise were assessed at 12 weeks after the program. Disease-specific health status (Western Ontario and McMaster Universities Osteoarthritis Index), general health status (12-item Short Form of the Medical Outcome Study Questionnaire), knee range of motion, muscle strength, and endurance of the lower extremities (Timed-Stands Test) were measured at the beginning of the program and 12 weeks after. Six participants were interviewed individually on the 12th week. Thirty-three participants (75.0±7.3 years) completed the one-group pretest and post-test study. The participants' exercise adherence was 91.4% ± 14.54%, and their correct performance in return-demonstration was 76.7% ± 21.75%. Most of the participants' health outcomes significantly improved at post tests except the 12-item Short Form of the Medical Outcome Study Questionnaire physical health summary score. The qualitative findings provided rich information to explain and support the quantitative results.

Jeannette saner et. al., (2015) conducted study to the effectiveness of tailored exercise program versus general exercise for a subgroup of patients with low back pain and movement control impairment. A randomised controlled trial with one-year follow. Using a multicentre randomised controlled trial (RCT), we compared exercises that targeted MCI (MC) with a general exercise (GE) treatment. After randomisation, patients in both groups (MC ¼ 52; GE ¼ 54) were treated in eight private physiotherapy practices and five hospital outpatient physiotherapy centres. Follow-up measurements were taken at post-treatment, six months and 12 months. The primary outcome measurement was the Patient Specific Function Scale (PSFS). PSFS showed no difference between groups after treatment, or at six months and 12 months. Secondary outcome analysis for pain and disability, measured with the Graded Chronic Pain scale and the Roland Morris Disability Questionnaire respectively, showed that a small improvement post-treatment levelled off over the long term. Both groups improved significantly ($p < 0.001$) over the course of one year.

CHAPTER-III

RESEARCH METHODOLOGY

This chapter explains the research methodology adapted by the researcher to study the effectiveness of tailored exercise program on the level of physical performance, mobility and falls efficacy among elderly in a selected old age home, Poovanthi. It includes research approach, research design, setting, population, sample, sampling technique, description of the the tool, pilot study, description of intervention, data collection procedure and plan for data analysis also dealt subsequently.

Research approach:

An quantitative approach was adopted by the investigator to find the effectiveness of tailored exercise program on levels of physical performance, mobility and falls efficacy.

Research design:

The investigator adopted pre experimental research design, one group pre test and post test design for this study. The diagrammatic representative of design is represented below.

Table 1

PRE TEST	EXPERIMENT	POST TEST
O_1	X	O_2

O_1 - pre test assessment of physical performance, mobility & falls efficacy.

O_2 - Post test assessment of physical performance, mobility & falls efficacy.

X - Tailored exercise 30minutes/day, 3days/week for 5weeks

Variables under the study:

In this study tailored exercise program was the independent Variable and the physical performance, mobility and falls efficacy was Dependent variable.

Setting of the study:

The study was conducted in a poongudil old age home, Poovanthi, which was located with in 2 kilo meters away from RASS Academy College of Nursing, Poovanthi, Sivagangai (Dt). Total population of this oldage home 72 persons, 18 bed ritterns, 4 under age of 60 years.

S**tudy Population:**

The study population comprised of elderly those who are residing in Poongudil old age home, Poovanthi, Sivagangai (Dt).

Sample

Elderly who fulfil the inclusion criteria was considered as a sample.

Sample size

Sample size was comprised of 30 elderly.

Sampling techniques:

The investigator adopted non probability purposive sampling technique was used to select samples for the study.

Criteria for the study:

Inclusive criteria:

Elderly who are,

- Aged 60 years and above
- Available during the period of data collection
- Willing to participate
- Able to verbalize their concern in preventing falls.

- Scoring more than 10/20 in mobility scale, 17/36 in physical performance scale and 20/64 in falls efficacy scale.

Exclusive criteria:

Elderly who

- Have musculo skeletal disorder
- Have neurological disorder
- Have total blindness
- Have total deafness
- Have gait and balance disorder
- Use assistive device for activities of daily living
- Affecting postural stability and movement disorder
- Had injury or fracture within last 5 years.

Description of the tool:

The tool contain Patient demography profile, physical performance scale, elderly mobility scale and falls efficacy scale.

Section A:

Demographic profile of age, gender, any history of co-morbid illness, history of previous fall, if yes frequency, time of previous fall, taken any treatment for previous fall.

Section: B

Falls Efficacy scale:

S. No	Subject	Not At All Concerned 1	Somewhat Concerned 2	Fairly Concerned 3	Very Concerned 4
1	Cleaning the house (e.g. sweep, vacuum or dust)				
2	Getting dressed or undressed				
3	Preparing simple meals				
4	Taking bath or shower				
5	Going shopping				
6	Getting in and out of chair				
7	Going up or downstairs				
8	Walking around in the neighbourhood				
9	Reaching for something above your head or on the ground				
10	Going to answer the telephone before it stops ringing				
11	Walking on a slippery surface [for example, wet or icy]				
12	Visiting a friend or relative				
13	Walking in a place with crowds				
14	Walking on an uneven surface[for example rocky ground, poorly maintained pavement]				
15	Walking up or down a slope				
16	Going out to a social event[for example, religious service, family gathering or club meeting]				

Score interpretation:

- 16 – 19 - low concern about falls
- **20 – 27 - moderate concern about falls**
- **28 – 64 - high concern about falls**

Section: C
Physical Performance Test:

1.	Standing static Balance	Feet together (sec)	Semi tandem (sec)	Tandem (sec)	Score (sec)
		10s 10s 10s 10s __0-9s	10s 10s 10s __0-9s Unable	__10s __3-9.9s __0-2.9s Unable Unable	__ 4 __ 3 __ 2 __ 1 __ 0
		Time	**Scoring values**		**Score**
2.	Chair rise		<11 sec - 4 11.1 - 14sec - 3 14.1 - 17sec - 2 >17sec - 1 Unable - 0		
3.	Lift a book and put it on a shelf		< 2sec - 4 2.1 - 4sec - 3 4.1-6sec - 2 >6sec - 1 Unable - 0		
4.	Put on and remove a jacket		<10sec - 4 10.1-15sec - 3 15.1 - 20sec - 2 >20 sec - 1 Unable - 0		
5.	pick up a penny from floor		< 2sec - 4 2.1 - 4sec - 3 4.1-6sec - 2 >6sec - 1 Unable - 0		
6.	Turn 360 degree	Discontinuous steps - 0 Continuous steps - 2			
		Unsteady (grabs, staggers) - 0 Steady - 1			
7.	50-foot walk test		< 15sec - 4 15.1 - 20sec - 3 20.1 - 25sec - 2 >25sec - 1 Unable - 0		
8.	Climb one flight of stairs		< 5sec - 4 5.1 - 10sec - 3 10.1 - 15sec - 2 >15sec - 1 Unable - 0		
9	Climb stairs	Number of flights of stairs up and down (maximum 4)			
TOTAL SCORE			**9- items score**		**/36**

Score interpretation:

- **32/36 –36/ 36 - Indicates not frail**
- **25/36 – 31/36 - Indicates mildly frail**
- **17/36 – 24/36 - Indicates moderate frail**
- <17/36 – unlikely to be able to function in the community

Section: D

Elderly mobility scale:

TASK	Date			
Lying to Sitting	2 Independent 1 Needs help of 1 person 0 Needs help of 2+ people			
Sitting to Lying	2 Independent 1 Needs help of 1 person 0 Needs help of 2+ people			
Sitting to Standin	3 Independent in under 3 seconds 2 Independent in over 3 seconds 1 Needs help of 1 person 0 Needs help of 2+ people			
Standing	3 Stands without support and able to reach 2 Stands without support but needs support to reach 1 Stands but needs support 0 Stands only with physical support of another person			
Gait	3 Independent (+ / - stick) 2 Independent with frame 1 Mobile with walking aid but erratic unsafe 0 Needs physical help to walk or constant supervision			
Timed Walk (6 metres)	3 Under 15 seconds 2 16 – 30 seconds 1 Over 30 seconds 0 Unable to cover 6 metres Recorded time in seconds			
Functional Reach	4 Over 20 cm. 2 10 - 20 cm. 0 Under 10 cm. Actual reach			
		/20	/20	/20

Score interpretation:

- **14 – 20 - Independent in activity of daily living**
- **10 – 13 - Borderline independent in activity of daily living**
- Below 10 – Dependent maneuvers and requiring help with basic activity of daily living

Pilot study:

In order to test the feasibility, relevance and practicability of the study. A pilot study was conducted among 6 patients who are 60 years and above 60 years old in the same manner of the original study in ANGEL old age home in karuppaurani. Data were analyzed to find out the reliability, it was 0.75.

Data collection procedure:

The investigator met the head of the old age home in order to establish support and co-operation to conduct the study successfully. The formal permission was taken from the higher authority of the old age home, for the main study. The investigator introduced her to the people in old age home and established rapport with them. Pre- experimental one group pre-test post-test design was used for the study. A total number of 30 elderly were selected through non probability purposive sampling technique. Appropriate orientation had given to the samples about the aim of the study, nature of questionnaire and adequate care was taken for confidentially and identity. First day pre test was conducted (It include demographic data, physical performance test, elderly mobility scale and falls efficacy scale)for 30 samples and Tailored exercise was given for 30 min/day on each Monday, Wednesday, and Friday for 5 weeks. The post test of the study was carried out 5 weeks later, using the same tool as same as pre – test. Collected data was then tabulated and analyzed.

Plan for data analysis:

The data analysis was done according to the objectives of study. Both descriptive and inferential statistics were used.

Descriptive statics:

Frequency, percentage and mean were used for analysis pre and post test assessment.

Inferential statistics:

Paired t-test was used to determine the difference between pre test and post test values in terms of effectiveness of Tailored exercise Program. Chi square test

was used to determine the association between the pretest level of physical performance, mobility and falls efficacy with their selected demographic variables.

Protection of human rights:

Researcher proposal was approved by dissertation committee, RASS ACADEMY COLLEGE OF NURSING, POOVANTHI. Prior to the study the oral concern of each sample was obtained before starting data collection. Assurance was given to the samples that confidentiality would be maintained.

CHAPTER – IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the analysis and interpretation of data collected from selected group of sample who have received physical performance, mobility and falls efficacy. The data collected were tabulated analyzed and presented based on objectives and hypothesis

It consists of the following sessions:

Section I – Distribution of samples according to their demographic variables

Section II – Distribution of samples according to their physical performance, mobility and falls efficacy.

Section III - Comparison of mean pre and post test level of physical performance, mobility and falls efficacy scale.

Section IV – Association between pre test level of physical performance with their selected demographic variables.

Section V - Association between pre test level of elderly mobility and their selected demographic variables

Section VI - Association between pre test level of falls efficacy scale and their selected demographic variables.

SECTION I

Distribution of the samples according to their demographic variables

Table 2

Distribution of the samples according to their demographic variables

(N=30)

S.No.	Demographic characteristics	Experimental Group (N =30)	
		F	%
1	Age (in years)		
	a. 60-65	5	16.7%
	b. 66-70	6	20%
	c. 70 above	19	63.3%
2	Gender:		
	a. Male	10	33.3%
	b. Female	20	66.7%
3	History of co-morbid illness		
	a. Yes	20	66.7%
	b. No	10	33.3%
4	History of previous Fall		
	a. No	17	56.7%
	b. Yes	13	43.3%
	If yes means		
4a	Frequency of fall		
	a. One time	9	69.2%
	b. < one time	4	30.8%
4b	Time of previous fall		
	a. Morning	6	46.2%
	b. Afternoon	2	15.4%
	c. Evening	3	23.1%
	d. Night	2	15.4%
4c	Treatment for previous fall		
	a. Physiotheraphy	0	0%
	b. Homeopathy	0	0%
	c. Alopathy	3	23.1%
	d. Home care	10	76.9%

Table 2 summarizes the majority of samples 19 out of 30(63.3%) in the age group were between 71 years above,6 out of 30 (20%) in the age group between 66 – 70 years and 5 out of 30(16.7%) in the age group between 60-65 years. With regard gender, the most of samples 20 out of 30(66.7%) were in females and10 out of 30 (33.3%) were in male. With regards of co- morbid illness 20 out of 30 (66.7%) were in yes and 10 out of 30 (33.3%)were in no. According to history of fall 17 out of 30 (56.7%) were in no fall and 13 out of 30 (43.3%) were in history of fall.

Among 13 with the fall history, 9(69.2%) had the incident once and 4 (30.8%) had the incident more than once. With regards to the Time of previous fall, 6 out of 13 (46.2%) were in morning, 2 out of 13(15.4 %) were in afternoon, 3 out of 13 (23.1%) were in evening and 2 out of 13 (15.4 %) were in night. And treatment of previous fall 0 out of 13 were in physiotheraphy, 0 out of 13 were in homeopathy, 3 out of 13 (23.1%) were in alopathy and 10 out of 13 (76.9%) were in home care.

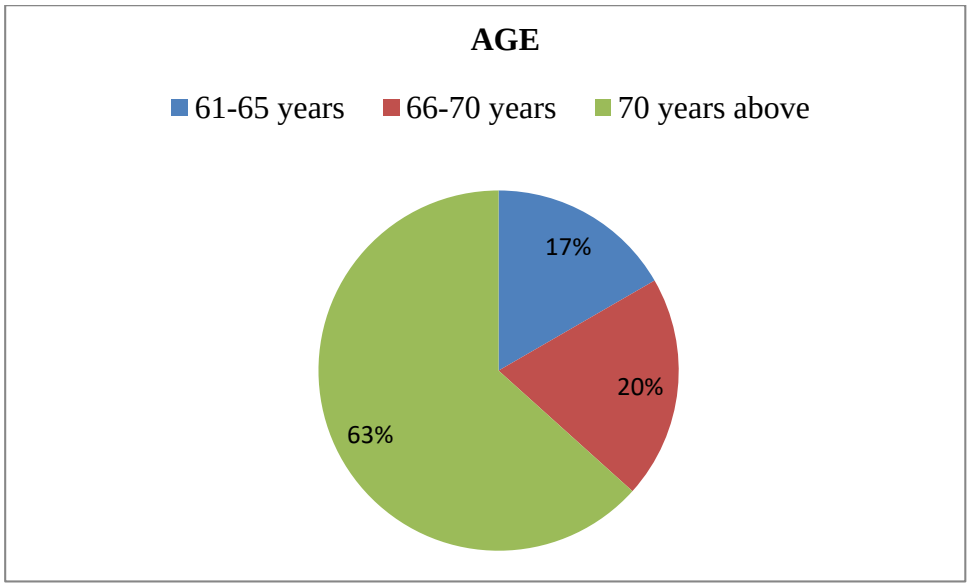

Figure 2: Distribution of samples according to their age.

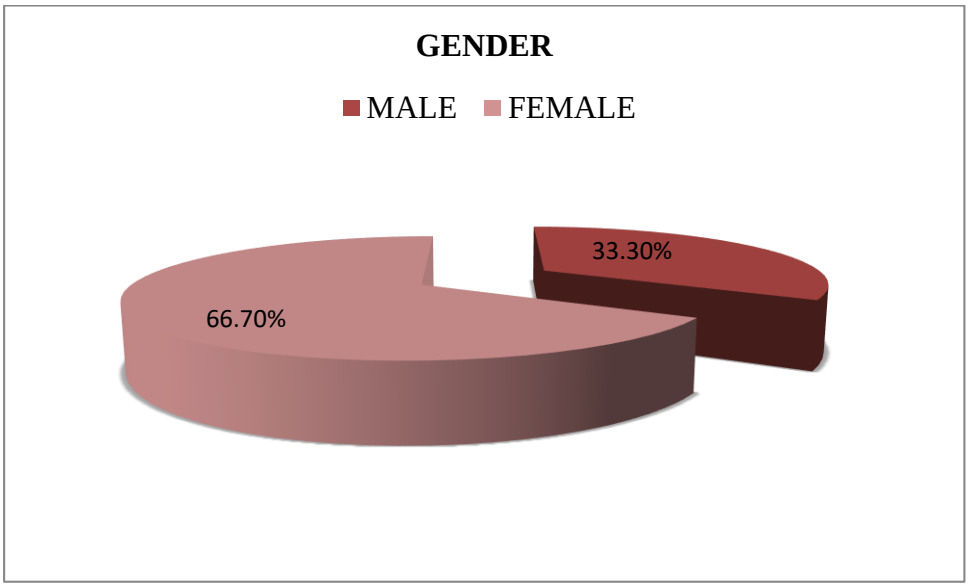

Figure 3: Distribution of samples according to their gender

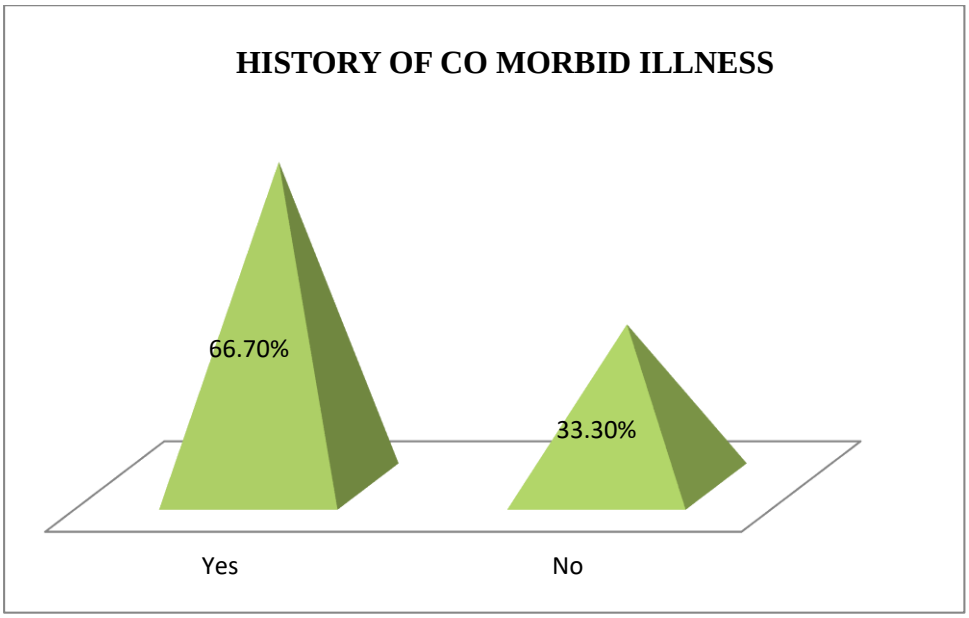

Figure 4: Distribution of samples according to their history of co-morbid illness

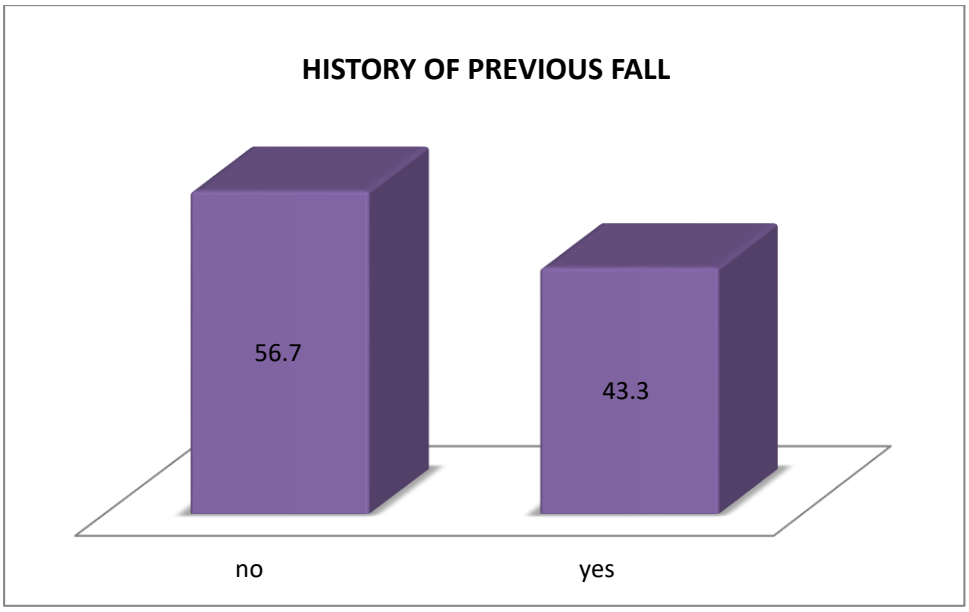

Figure 5: Distribution of samples according to their history of previous fall

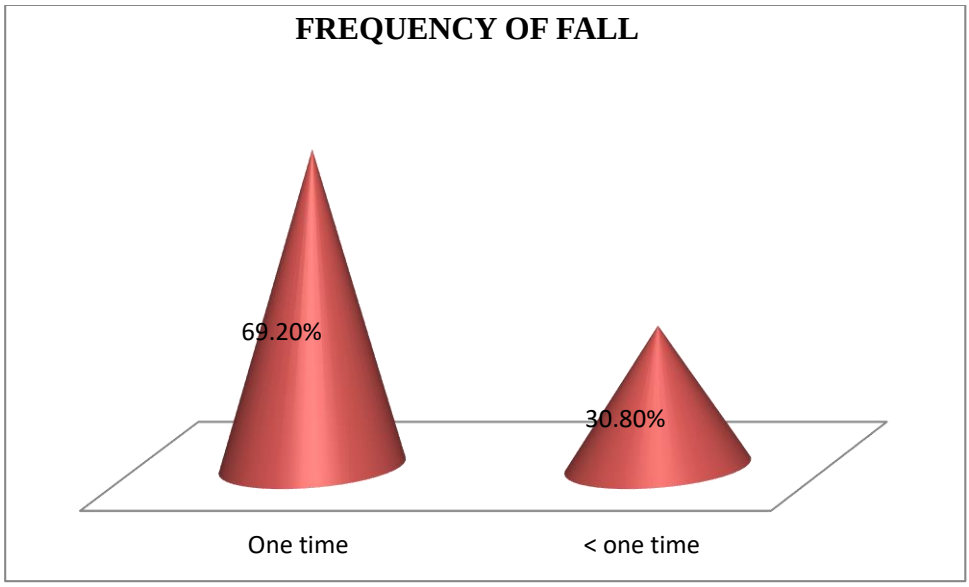

Figure 6: Distribution of samples according to their frequency of fall

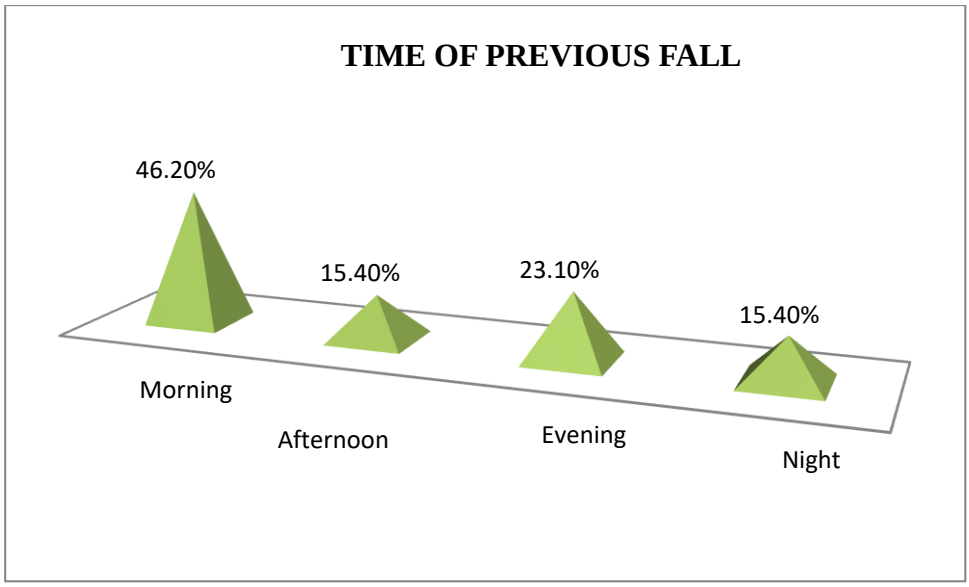

Figure 7: Distribution of samples according to their time of previous of fall

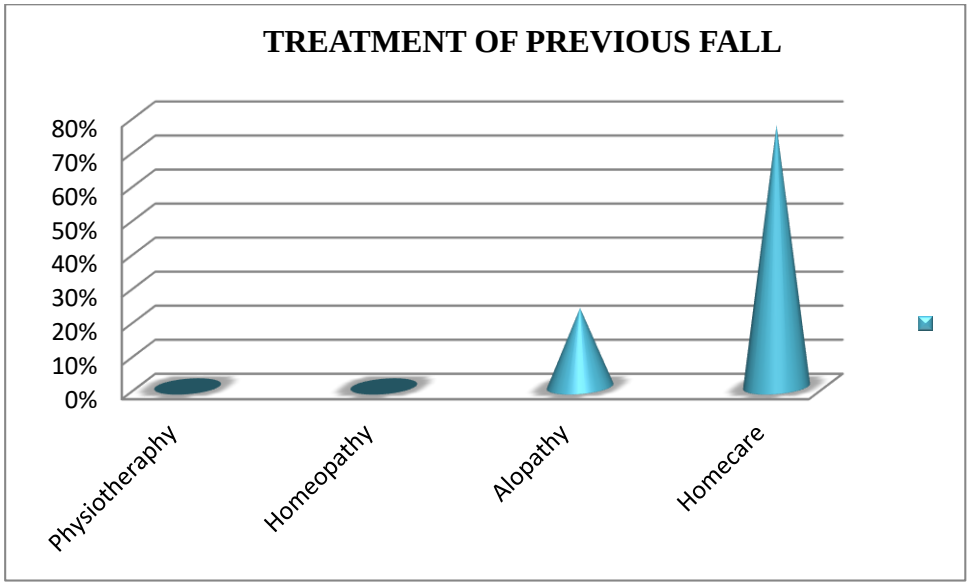

Figure 8: Distribution of samples according to their treatment of previous fall

SECTION II

Distribution of samples according to their physical performance, mobility and falls efficacy.

Table 3

Distribution of samples according to their physical performance, mobility and falls efficacy.

Name of the scale	Pre test		Post test	
	F	**%**	**F**	**%**
Level of physical performance				
> 17 - unable to function	-	-	-	-
17 -24 – moderate frailty	22	73.3%	-	-
25-31 – mild frailty	8	26.6%	29	96.6%
32-36 – not frail	-	-	1	3.3%
Level of mobility				
>10 - dependent manuver	-	-	-	-
10 -13 – borderline independent ADL	25	83.3%	1	3.3
<14 - Independent ADL	5	16.6%	29	96.6%
Levels of fall efficacy				
16-19 – low concern	-	-	3	10%
20- 27 – moderate concern	10	33.3%	8	26.6%
28-64 – high concern	20	66.6%	19	63.3%

Table 3 shows, regarding the level of physical performance in pre test none of them in unable to function, 22 out of 30 (73.3%)samples having moderate fralilty ,and 8 out of 30 (26.6%) sample having mild frailty level, and none of them in not frail. In post test level of physical performance none of them were below 17, none of there in between 32-36 (not frailty).

In the level of mobility in pre test,none of them in >10 (dependent manuver), 25 out of 30 (83.3%)in between 10 -13(borderline independent in daily living activity), 5 out of 30 (16.6%) in above 14 (independent in daily living activity) and post test none of them in >10 (dependent manuver),25 out of 30 (33%) in between 10-13 (borderline independent in daily living activity)29 out of 30(96.6%) in above 14 (independent in daily living activity).

In the level of fall efficacy in pre test, none of them in 16-19 (low concern) 20-27 (moderate concern)10 out of 30 (33.3%) in 28-64 (high concern) 20 out of 30 (66.6%) and post test 16-19 (low concern) 3 out of 30 (10%) 20-27 (moderate concern) 8 out of 30 (26.6%) in 28-64 (high concern) 19 out of 30 (63.3%).

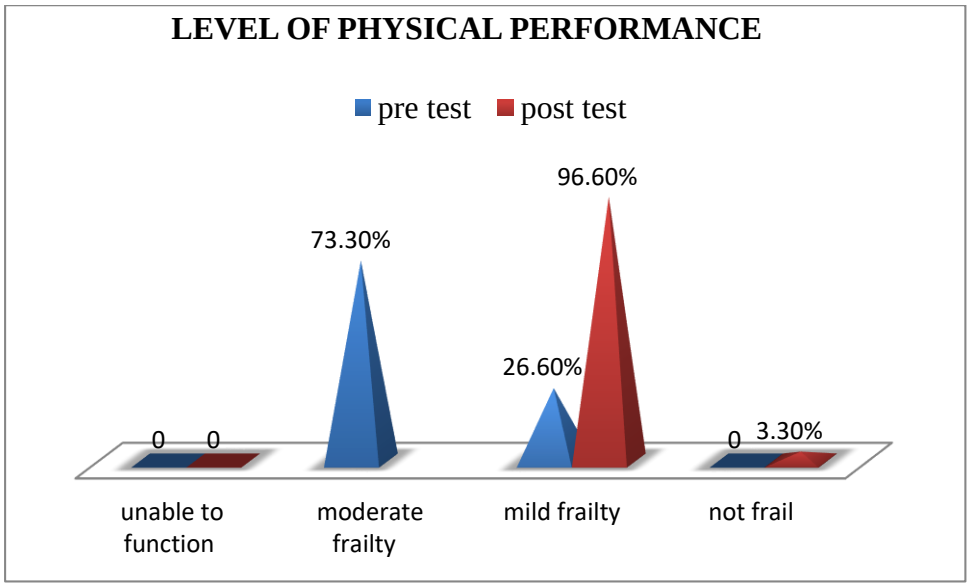

Figure 9: comparison between pre and post test level of physical performance

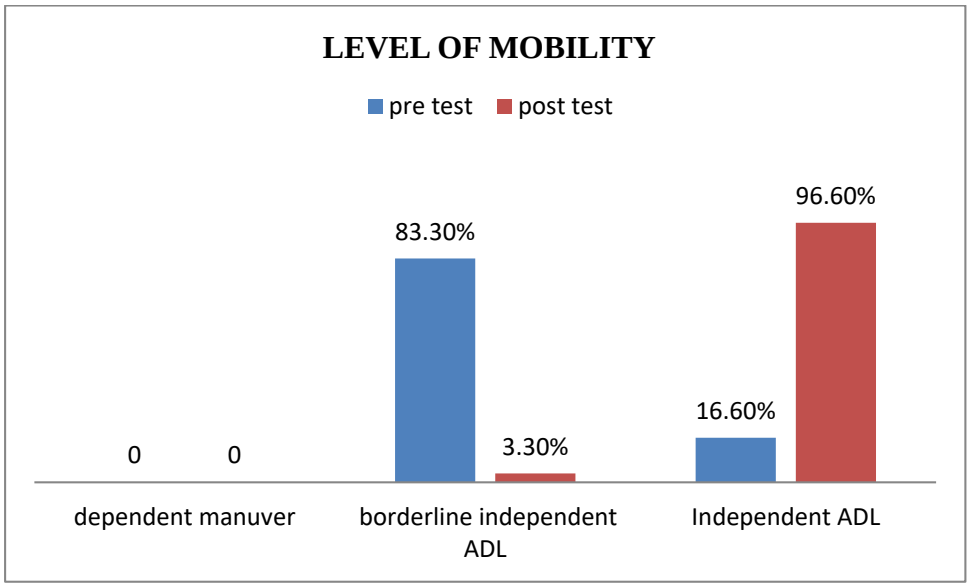

Figure 10: comparison between pre and post test level of mobility

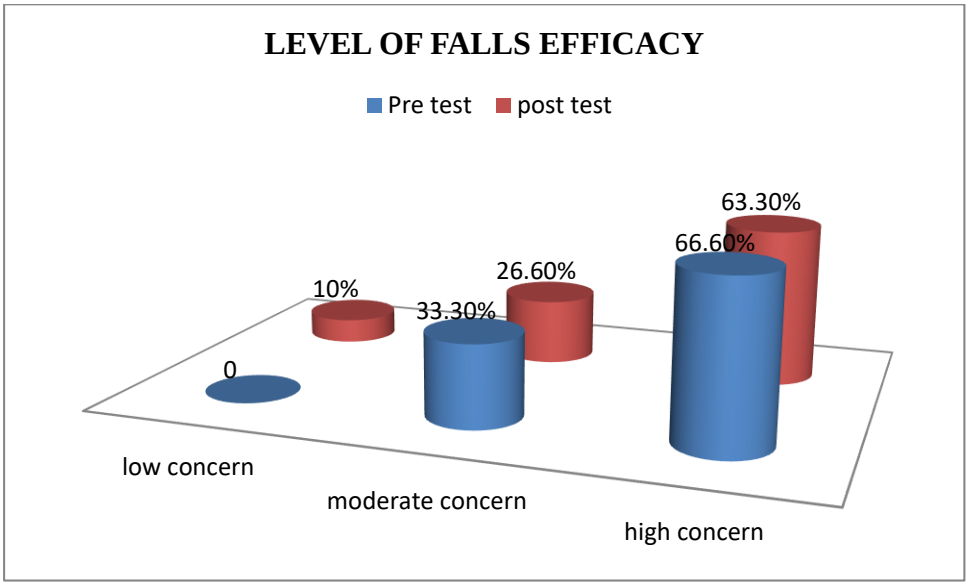

Figure 11: comparison between the pre and post test level of falls efficacy

SECTION III

Comparison of mean pre and post test level of physical performance, mobility and falls efficacy scale.

Table 4

Comparison of mean pre and post test level of physical performance, mobility and falls efficacy scale.

S. No	Scale name	Pre test mean	Post test mean	Mean difference	Standard deviation	Paired "t" test
1	**Physical performance test**	22.2	26.9	4.7	2.5	11.53
2	**Elderly mobility scale**	14.8	26.2	11.4	1.2	10.17
3	**Falls Efficacy scale**	41.6	31.6	10	5.013	10.80

(** =Significant at 0.05 level)

Table 5 shows regarding the level of physical performance in pre test mean value 22.2, post test mean value 26.9 , pre and post test mean difference 4.7 standard deviation value 2.5, paired “t” test value 11.53 was greater than table value at 0.05 level of significant, which shows that there is significant difference between the pre test and post test level of physical performance. Hence, the formulated research hypothesis **H_1 was accepted.**

In elderly mobility pre test mean value 14.8, post test mean value 26.2 , pre and post test mean difference11.4, standard deviation 1.2 and paired “t” test value 10.17 was greater than table value at 0.05 level of significant, which shows that there is significant difference between the pre test and post test level of mobility. Hence, the formulated research hypothesis **H_1 was accepted.**

In falls efficacy pre test mean value 41.6, post test mean value 31.6 , pre and post test mean difference 10, standard deviation value 2.26 and falls efficacy & paired “t” teat value 10.80 was greater than table value at 0.05 level of significant, which shows that there is significant difference between the pre test and post test level of mobility. Hence, the formulated research hypothesis **H_1 was accepted.**

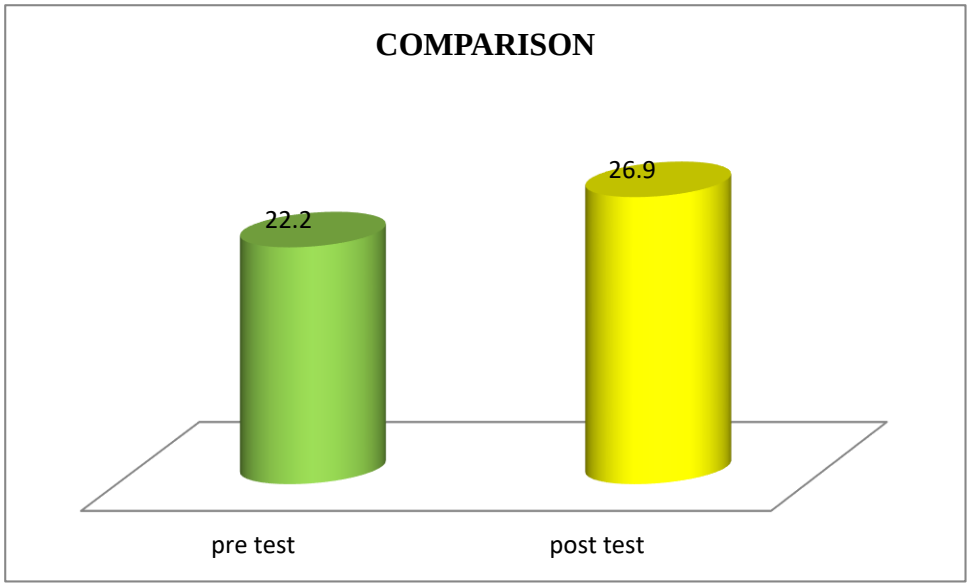

Figure 13: comparison between the pre and post test mean level of physical performance test

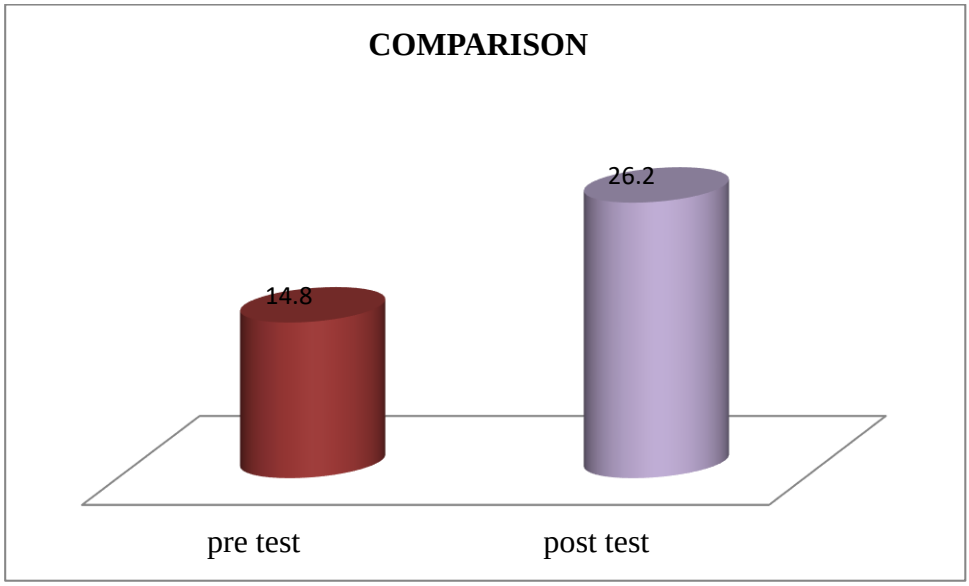

Figure 14: comparison between the pre and post test mean level of mobility test

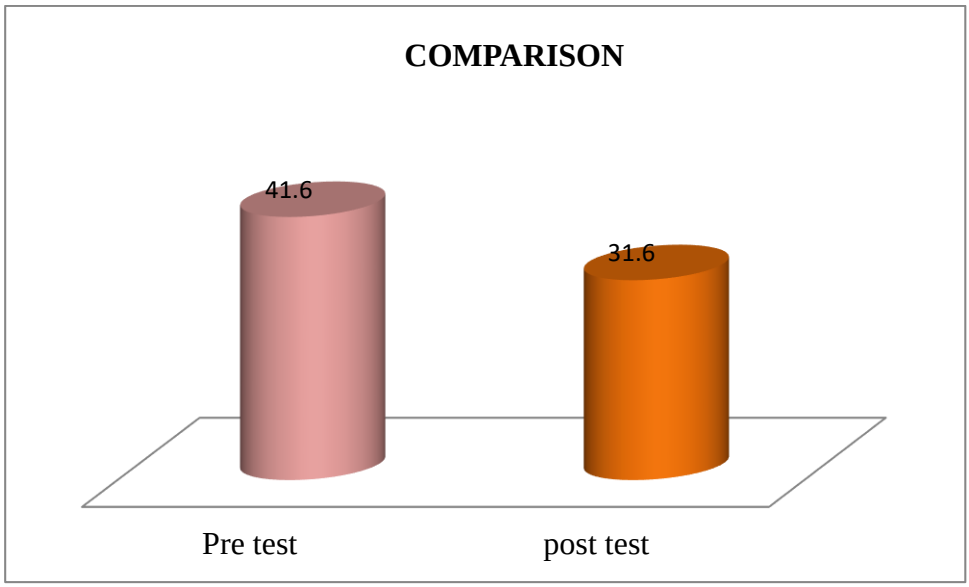

Figure 15: comparison between the pre and post mean level of falls efficacy scale

SECTION IV

Association between pre test level of physical performance with their selected demographic variables.

Table 5

Association between pre test level of physical performance with their selected demographic variables.

(N=30)

Demographic Variables	Sample (n)		Physical Performance								Chi Square χ^2 value P<0.05
			32-36		25-31		17-24		<17		
	No	%	No	%	No	%	No	%	No	%	
1.Age											
a. 60 – 65	5	16.7	-	-	1	20	4	80	-	-	1.203
b. 66 – 70	6	20	-	-	-	-	6	-	-	-	DF-2
c. < 70	19	63.3	-	-	11	-	8	100	-	-	NS
2.Gender											
a. Male	10	33.3	-	-	2	20	8	80	-	-	0.052
b. Female	20	66.7	-	-	6	30	14	70	-	-	DF-1 NS
3.Co-morbid illness											
a. Yes	20	66.7	-	-	4	20	16	80	-	-	1.65
b. No	10	33.3	-	-	3	30	7	70	-	-	DF-1 NS
4.History of previous fall	17	56.6	-	-	5	29.4	12	70.6	-	-	5.417
a. No	13	43.3	-	-	13	100	-	-	-	-	DF-2
b. Yes											**
If yes, means											
5.Frequency of fall											
a. One time	9	69.2	-	-	9	100	-	-	-	-	4.76
b. < one time	4	30.8	-	-	4	100	-	-	-	-	DF-1 **
6.Time of fall											
a. morning	6	46.2	-	-	6	100	-	-	-	-	
b. Afternoon	2	15.4	-	-	2	100	-	-	-	-	0.978
c. Evening	3	23.1	-	-	3	100	-	-	-	-	DF-3
d. Night	2	15.4	-	-	2	100	-	-	-	-	NS
7.Treatment of fall											
a. Physiotheraphy	0	0	-	-	-	-	-	-	-	-	
b. Homeopathy	0	0	-	-	-	-	-	-	-	-	0.6
c. Alopathy	3	23.1	-	-	3	100	-	-	-	-	DF- 3
d. Home care	10	76.9	-	-	10	100	-	-	-	-	NS

NS- not significant at 0.05 level
**significant at 0.05 level

Table 5 summarizes, in order to find out the association between demographic variable and p test level of physical performance and age chi square test was computed. For the convenience of computation and tabulation the researcher had age group as 60-65 years and 66-70 years and >70 years .the obtained χ^2 value of 1.203at df (2) was not significant at 0.05 level on considering, pain level and gender, the calculated χ^2 value 0.652 at df (1) was not significant at 0.05 level with regards to pain level co morbid illness, the calculater χ^2 value was 1.65 at df (1)was not significant at 0.05 level regarding the history of previous fall, the collected χ^2 value was 5.417 at df (1) significant at 0.05 level. Regarding frequency of fall, the calculated value was 4.76 at df(1) was significant at 0.05 level, with regard to time of previous fall, the calculated χ^2 value0.978 at df(3) was not significant at 0.05 level. Regarding the treatment of previous fall, the calculated χ^2 value 0.6 at df (3) was not significant at o.05 level. So the study concluded exercise program is effective on physical performance. Hense, hypothesis H_2 was accepted.

SECTION V

Association between pre test level of elderly mobility and their selected demographic variables

Table 6

Association between pre test level of elderly mobility and their selected demographic variables

(N = 30)

Demographic variables	Sample(n)		Elderly Mobility						Chi square χ^2 Value P<0.05
	No	%	< 10		10 – 13		>14		
			No	%	No	%	No	%	
1.Age									
a. 60 – 65	5	16.7	-	-	4	80	1	20	4.621
b. 66 – 70	6	20	-	-	5	83.3	1	16.7	DF-2
c. < 70	19	63.3	-	-	16	84.2	3	15.8	NS
2.Gender									
a. Male	10	33.3	-	-	9	90	1	10	0.057
b. Female	20	66.7	-	-	16	80	4	20	DF-1 NS
3.Co- morbid illness									
a. Yes	20	66.7	-	-	8	90	2	10	1.197
b. No	10	33.3	-	-	7	70	3	30	DF-1 NS
4.History of previous fall									
a. No	17	56.7	-	-	16	94.1	1	5.9	4.06
b. Yes	13	43.3	-	-	9	55.6	4	44.4	DF-1 NS
If yes, means									
5.Frequency fall									
a. One time	9	69.4	-	-	9	55.6	4	44.4	4.2
b. < one time	4	30.8	-	-	4	100	-	-	DF-1 **
6.Time of fall									
a. Morning	6	46.2	-	-	4	66.7	2	33.3	
b. Afternoon	2	15.4	-	-	2	100	-	-	3.82
c. Evening	3	23.1	-	-	1	33.3	2	66.7	DF-3
d. Night	2	15.4	-	-	2	100	-	-	NS
7.Treatment of fall									
a. Physiotherapy	0	0	-	-	-	-	-	-	
b. Homeopathy	0	0	-	-	-	-	-	-	0.48
c. Alopathy	3	23.1	-	-	3	100	-	-	DF-3
d. Home care	10	76.9	-	-	6	60	4	100	NS

NS- not significant at 0.05 level

**significant at 0.05 level

Table 6 summarizes, in order to find out the association between the post test level of elderly mobility scale and age χ^2 test was computed for the convenience of computation and tabulation the researcher had age group 60-65 years and 65- 70 years and above 70 years the obtain χ^2 value of 4.621 at df (2) was not significant at 0.05 level and considering , the gender, the calculated χ^2 value was 0.057 at df(1) was not significant at 0.05 level. Regarding the co-morbid illness, the calculated χ^2 value 1.197at df(1) was not significant at 0.05 level. Regarding history of previous fall, the calculated χ^2 value was 4.06 at df(2) was not significant at 0.05 level. Regarding frequency of fall, the calculated χ^2 value 4.2 at df (1) was significant at 0.05 level. Regard the time of previous fall calculated the χ^2 value 3.82 at df(3) was not significant at 0.05 level. Regarding the treatment of falls, the calculated χ^2 value 0.48 at df (3) was not significant at 0.5 level. So the study concluded exercise program is effective on physical performance.

SECTION VI

Association between pre test level of falls efficacy scale and their selected demographic variables.

Table 7
Association between pre test level of falls efficacy scale and their selected demographic variables.

(N=30)

Demographic variables	Sample(n)		Falls efficacy						Chi square χ^2 Value P<0.05
	No	%	16 – 19		20 - 27		28 – 64		
			No	%	No	%	No	%	
1.Age									
1. 60 – 65	5	16.7	-	-	1	20	4	80	4.29
2. 66 – 70	6	20	-	-	-	-	6	100	DF-2
3. < 70	19	63.3		-	9	47.4	10	52.6	NS
2.Gender									
a. Male	10	33.3	-	-	3	30	7	70	0
b. Female	20	66.7	-	-	7	35	12	65	DF-1 NS
3.Co- morbid illness									
a. Yes	20	66.7	-	-	6	30	14	70	0.198
b. No	10	33.3	-	-	4	40	6	60	DF-1 NS
4.History of previous fall									
a. No	17	56.7	-	-	7	41.2	10	58.8	3.408
b. Yes	13	43.3	-	-	3	23.07	10	76.9	DF-1
If yes, means,									NS
5.Frequency falll	9	69.4	-	-	3	33.3	6	66.7	3.45
a. One time	4	30.8	-	-	-	-	4	100	DF-1
b. < one time									NS
6.Time of fall									
a. Morning	6	46.2	-	-	-	-	-	-	
b. Afternoon	2	15.4	-	-	1	50	1	50	1.299
c. Evening	3	23.1	-	-	1	33.3	2	66.7	DF-3
d. Night	2	15.4	-	-	-	-	2	100	NS
7.Treatment of fall									
a. Physiotheraphy	0	0	-	-	-	-	-	-	
b. Homeopathy	0	0	-	-	-	-	-	-	0.019
c. Alopathy	3	23.1	-	-	1	33.3	2	66.7	DF-3
d. Home care	10	76.9	-	-	1	10	9	90	NS

NS- not significant at 0.05 level
significant at 0.05 level

Table 7 summarizes, in order to find out the association between the post test level of falls efficacy and age χ^2 test was computed for convenience of computation and tabulation the researcher had age group as 60-65 years and 65-70 years and above 70 years. The obtained χ^2 value of 4.29 at df (2) was not significant at 0.05 level. Regarding the gender, the calculated χ^2 value was 0 at df (1) was not significant at 0.05 level. Regarding the co-morbid illness, the calculated χ^2 value was 0.198 at df (1) was not significant at 0.05 level. Regarding the history of previous fall, the calculated χ^2 value was 3.408 at df (2) was not significant at 0.05 level. Regarding the frequency of falls, the calculated χ^2 value was 1.299 at df (1) was not significant at 0.05 level. Regard the time of previous fall, the calculated χ^2 value was 3.45 at df (1) was not significant at 0.05 level. Regarding the treatment of falls, the calculated χ^2 value was 0.019 at df (3) was not significant at 0.05 level. There was no association between falls efficacy and the selected demographic variables such as age, gender, co-morbid illness, history of previous fall, if yes mean, frequency of fall, time of previous fall, and treatment of fall.

CHAPTER V

DISCUSSION, SUMMARY, CONCLUSION, IMPLICATION AND RECOMMENDATION

Discussion:

The present study was designed to assess the effectiveness of tailored exercise program on level of physical performance, mobility and falls efficacy among the elderly in poongudil old age at poovanthi, Sivagangai (Dt).

To find out the effectiveness of the effectiveness of tailored exercise, the investigator adopted pre experimental one group pre-test post-test design and 30 elderly were selected through purposive sampling technique.

Demographic variables:

1. With regard to age, 19 out of 30(63.3%) in the age group between 71 year above,6 out of 30 (20%) in the age group between 66 – 70 years and 5 out of 30(16.7%) in the age group between 60-65 years.
2. In case of gender, the most of samples 20 out of 30(66.7%) were in females and10 out of 30 (33.3%) were in male.
3. With regards of co- morbid illness, 20 out of 30 (66.7%) were in yes and 10 out of 30 (33.3%) were in no.
4. According to history of fall, 17 out of 30 (56.7%) were in no fall and 13 out of 30 (43.3%) were in history of fall.
5. Among 13 with the fall history, 9 (69.2%) had the incident once and 4 (30.8%) had the incident more than once.
6. With regards to the Time of previous fall, 6 out of 13 (46.2%) were in morning, 2 out of 13(15.4 %) were in afternoon, 3 out of 13 (23.1%) were in evening and 2 out of 13 (15.4 %) were in night.
7. In case of treatment of previous fall, 0 out of 13 were in physiotheraphy, 0 out of 13 were in homeopathy, 3 out of 13 (23.1%) were in alopathy and 10 out of 13 (76.9%) were in home care.

The first objectives was to assess the level of physical performance, mobility and falls efficacy among the elderly.

Regarding the level of physical performance in pre test none of them inunable to function, 22 out of 30 (73.3%)samples having moderate fralilty, and 8 out of 30(26.6%) sample having mild frailty level, and none of them in not frail. In post test level of physical performance none of them were below 17, none of there in between 32-36 (not frailty).

In the level of mobility in pre test,none of them in >10 (dependent manuver), 25 out of 30 (83.3%)in between 10 -13(borderline independent in daily living activity), 5 out of 30 (16.6%) in above 14 (independent in daily living activity) and post test none of them in >10 (dependent manuver),25 out of 30 (33%) in between 10-13 (borderline independent in daily living activity)29 out of 30(96.6%) in above 14 (independent in daily living activity).

In the level of fall efficacy in pre test, none of them in 16-19 (low concern) 20-27 (moderate concern)10 out of 30 (33.3%) in 28-64 (high concern) 20 out of 30 (66.6%) and post test 16-19 (low concern) 3 out of 30 (10%) 20-27 (moderate concern) 8 out of 30(26.6%) in 28-64 (high concern) 19 out of 30 (63.3%).

Jennifer A. et.al. (2005) had concocter a cross sectional study to evaluate the Effect of High-Intensity Strength-Training on Functional Measures of Balance Ability in Balance-Impaired Older Adults. After strength training, the exercisers were significantly stronger than the control subjects. They improved significantly on the Berg Balance Scale (P=.030) from a mean score of 48.8 + 2.4 of 56 before training to 51.2 + 4.3 of 56 after training. The Timed Up and Go (P=.045) and the Activities-Specific Balance Confidence Scale (P=.038) also improved significantly in the experimental group. These changes are associated with a decrease in fall risk. The findings of Jennifer A supports the finding of the present study.

The second objective was to evaluate the effectiveness of tailored exercise on the level of physical performance, mobility and the falls efficacy among elderly.

In case of regarding the level of physical performance in pre-test mean value 22.2, post test mean value 26.9 , pre and post-test mean difference 4.7 standard deviation value 2.5, paired “t” test value 11.53 was greater than table value at 0.05

level of significant, which shows that there is significant difference between the pre test and post test level of physical performance. Hence, the formulated research hypothesis **H_1 was accepted.**

In elderly mobility pre test mean value 14.8, post test mean value 26.2 , pre and post test mean difference11.4, standard deviation 1.2 and paired "t" test value 10.17 was greater than table value at 0.05 level of significant, which shows that there is significant difference between the pre test and post test level of mobility. Hence, the formulated research hypothesis **H_1 was accepted.**

In falls efficacy pre test mean value 41.6, post test mean value 31.6 , pre and post test mean difference 10, standard deviation value 2.26 and falls efficacy & paired "t" teat value 10.80 was greater than table value at 0.05 level of significant, which shows that there is significant difference between the pre test and post test level of mobility. Hence, the formulated research hypothesis **H_1 was accepted.**

Rubenstein LZ et. al., (2000) had conducted a cross sectional study to evaluate the Effect of group exercise program on strength, mobility and falls-prone elderly men, Fifty-nine community-living men (mean age + 74 years) with specific fall risk factors (i.e., leg weakness, impaired gait or balance, previous falls) were randomly assigned to a control group (n=28) or to a 12 week group excise program (n=31). Exercise showed significant improvement in measures of endurance and gait. Isokinetic endurance increased 21% for right knee flexion and 26% for extension. Exercisers had a 10% increase ($p<.05$) in distance walked in six minutes, and improved ($p<.05$) scores on an observational gait scale. Isokinetic strength improve only for right knee flexion. The findings of Rubenstein LZ supports the finding of the present study.

The third objective was to find out the association between the pre test level of physical performance, mobility and falls efficacy with their selected demographic variables.

In order to find out the association between demographic variable and pre test level of physical performance chi square test was computed. The calculated value of history of fall and the frequency of fall (DF-1) was higher than the table value (5.417 and 4.76). There was an association between the pre test level of physical

performance and the frequency & history of fall. The remaining variable such as age, gender, co-morbid illness and time of fall, treatment of fall the calculated value was lower than table value. So there was no association between the pre-test level of physical performance and the demographic variables such as age, gender, co-morbid illness, time of fall and treatment of fall.

The association between demographic variable and pre test level of mobility was computed using chi square test. The calculated value of the frequency of fall (DF-1). was higher than the table value (4.2). There was an association between the pre test level of mobility and the frequency of fall .The remaining variable such as age, gender, co-morbid illness, history of fall time of fall and treatment of fall the calculated value was lower than table value. So there was no association between the pre test level of mobility and the demographic variables such as age, gender, co-morbid illness history of fall time of fall and frequency of fall.

The association between demographic variable and pre test level of falls efficacy was computed using chi square test. The demographic variable such as age, gender, co-morbid illness, history of fall time of fall and treatment of fall the calculated value was lower than table value. So there was no association between the pre test level of falls efficacy and the demographic variables such as age, gender, comorbid illness, history of fall and time of fall.

Summary of the study:

The study was undertaken to assess the effectiveness of tailored exercise program on the level of physical performance, mobility and falls efficacy among elderly in poongudil old age home at poovanthi. Sivagangai (Dt). The following **objectives** were set for the study.

The following **objectives** were set for the study

- To evaluate the level of physical performance, mobility and falls efficacy before tailored exercise program among elderly.
- To evaluate the effectiveness of tailored exercise program on the level of physical performance, mobility and falls efficacy among elderly.
- To associate the post test level of physical performance, mobility and falls efficacy and the selected demographic variables of elderly.

The study was conducted for a period of 1 month in poongudil old age home, poovanthi. A Pre- experimental one group pre-test post-test design was used for the study. One group pre and post test was adopted for the study. The sample size was 30. Non probability purposive sampling technique was adopted for assigning the subjects. The tool consists of patient demographic profile, physical performance test, elderly mobility scale and falls efficacy. First day pre test was conducted (It include demographic data, physical performance test, elderly mobility scale and falls efficacy scale) for 30 samples and Tailored exercise was given for 30 min/day on each Monday, Wednesday, and Friday for 5 weeks. The post test of the study was carried out 5 weeks later, using the same tool as same as pre – test. Collected data was then tabulated and analysed.

Major findings of the study:

- Majority of the samples, 19 out of 30(63.3%) in the age group between 71 year above. In case of gender, the most of samples 20 out of 30(66.7%) were in females.

- With regards of co- morbid illness, 20 out of 30 (66.7%) were in yes. According to history of fall 17 out of 30 (56.7%)were in no fall.

- Among 13 with the fall history, 9 (69.2%) had the incident of fall. With regards to the Time of previous fall, 6 out of 13 (46.2%) were in morning. In case of treatment of previous fall, 10 out of 13 (76.9%) were in home care.

- Regarding the level of physical performance, in pre test mean value 22.2, post test mean value 26.9 , pre and post test mean difference 4.7 standard deviation value 2.5, paired “t” test value 11.53.

- In elderly mobility, pre test mean value 14.8, post test mean value 26.2 , pre and post test mean difference11.4, standard deviation 1.2 and paired “t” test value 10.17. In falls efficacy pre test mean value 41.6, post test mean value 31.6, pre and post test mean difference 10, standard deviation value 2.26 and falls efficacy & paired “t” teat value 10.80 was greater than table value at 0.05 level of significant, which shows that there is significant difference between the pre test and post test level of physical performance, mobility and falls efficacy. Hence, the formulated research hypothesis **H_1 was accepted.**

- With regards to association, the pre test level of elderly mobility the pre test level of falls efficacy and the demographic variable, the computed chi square value of age, gender, comorbidity, previous fall, frequency of fall ,time of fall and treatment of fall was below the table value ,hence there was no association. Regarding physical performance, the computed chi square value of history of fall and the frequency of fall (DF-1) was higher than the table value (5.417 and 4.76). Regarding mobility, the computed chi square value of frequency of fall (DF-1) was higher than the table value (4.2). So they study concluded exercise program is effective on physical performance and mobility. Hence, hypothesis **H_2 was accepted.**

Conclusion :

The study findings provide the statistical evidence which clearly indicates that the tailoring exercise has improved the level of physical performance, mobility, and reduce the level of falls efficacy among elderly.

Implications:

Nurses can use the tailored exercise programme and improve the level of physical performance, mobility and reduce falls efficacy. The present study have several implications in Nursing practice, Nursing education, Nursing research, Nursing administration and Nursing research.

Nursing practice

- The findings of the study enlighten the fact that tailored exercise given before check the level of physical performance, mobility and falls efficacy and after 5 Weeks post test was conducted again check the level of physical performance, mobility and falls efficacy.
- The study findings help the nursing practice personnel to include tailored exercise given as a nursing intervention to improve the physical performance, mobility and reduce falls efficacy

Nursing Education

- The study will provoke the nursing and non nursing personnel to acquire knowledge regarding tailored exercise and its benefits.
- The study will enable the students to compare self instructional module with other forms of teaching aids.
- Nation wide network can be organized to share the knowledge to create awareness about the incidence of injury due to illness and various other measures to reduce the fall.

Nursing Administration

- These findings will help the administrations to encourage the nurses to use tailored exercise give to enhance physical performance and mobility and falls efficacy.
- These findings will help the administrators to arrange a continuing education programme for nurses regarding tailored exercise and other various intervention to improve the level of physical performance, mobility and falls efficacy.
- Charts regarding uses of tailored exercise can be fixed in the old age home so that it can motivate the elderly to practice it.

Nursing research

- This study can be a baseline for future studies to build upon and motivate the investigators to conduct further studies.
- A study can be done with large samples.

Limitations

- The limitation of the study were:
- The sample size was 30.
- The finding can be generalized with cautions.
- The subjects can be randomized to improve the effectiveness.

Recommendations

- A similar study can be replicated with larger sample.
- A similar study can be conducted by using true experimental design.
- A similar study can be conducted on a long term basis to prove the summative effect of tailored exercise program.
- This study can be done as a comparative study in different settings.
- A follow up study can be done to find out whether the nurses are practicing tailored exercise program on the level of physical performance, mobility and falls efficacy among the elderly

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APPENDIX I

Tools:

Section: A

DEMOGRAPHIC DATA

Sample no:

1. Age

   (a) 61 – 65 years (b) 66 – 70 years (c) 71 years above

2. Sex

   (a) Male (b) Female

3. Any history of co-morbid illness

   (a) yes (b) no

   If , yes

Mention the name of illness:

Treatment:

4. History of previous fall

   (a) no (b) yes

   If yes, means

4a. Frequency of previous fall

   (a) Once (b) < one time

4b. Time of previous fall

   (a) morning (b) afternoon (c) evening (d) night

4c. Taken any treatments for previous fall

   (a) physiotherapy (b) homeopathy (c) alopathy (d) homecare

Section: B

Falls Efficacy scale

S. No	SUBJECT	Not at all concerned 1	Somewhat concerned 2	Fairly concerned 3	Very concerned 4
1	Cleaning the house (e.g. sweep, vacuum or dust)				
2	Getting dressed or undressed				
3	Preparing simple meals				
4	Taking bath or shower				
5	Going shopping				
6	Getting in and out of chair				
7	Going up or downstairs				
8	Walking around in the neighbourhood				
9	Reaching for something above your head or on the ground				
10	Going to answer the telephone before it stops ringing				
11	Walking on a slippery surface [for example, wet or icy]				
12	Visiting a friend or relative				
13	Walking in a place with crowds				
14	Walking on an uneven surface[for example rocky ground,poorly maintained pavement]				
15	Walking up or down a slope				
16	Going out to a social event[for example,religious service,family gathering or club meeting]				

Score interpretation:

- 16 – 19 - low concern about falls
- **20 – 27 - moderate concern about falls**
- **28 – 64 - high concern about falls**

Section: C
Physical Performance Test

1.	Standing static Balance	Feet together (sec)	Semi tandem (sec)	Tandem (sec)	Score (sec)
		10s 10s 10s 10s __0-9s	10s 10s 10s __0-9s Unable	__10s __3-9.9s __0-2.9s Unable Unable	__ 4 __ 3 __ 2 __ 1 __ 0
		Time	**Scoring values**		**Score**
2.	Chair rise		<11 sec - 4 11.1 - 14sec - 3 14.1 - 17sec - 2 >17sec - 1 Unable - 0		
3.	Lift a book and put it on a shelf		< 2sec - 4 2.1 - 4sec - 3 4.1-6sec - 2 >6sec - 1 Unable - 0		
4.	Put on and remove a jacket		<10sec - 4 10.1-15sec - 3 15.1 - 20sec - 2 >20 sec - 1 Unable - 0		
5.	pick up a penny from floor		< 2sec - 4 2.1 - 4sec - 3 4.1-6sec - 2 >6sec - 1 Unable - 0		
6.	Turn 360 degree	Discontinuous steps - 0 Continuous steps - 2			
		Unsteady (grabs, staggers) - 0 Steady - 1			
7.	50-foot walk test		< 15sec - 4 15.1 - 20sec - 3 20.1 - 25sec - 2 >25sec - 1 Unable - 0		
8.	Climb one flight of stairs		< 5sec - 4 5.1 - 10sec - 3 10.1 - 15sec - 2 >15sec - 1 Unable - 0		
9	Climb stairs	Number of flights of stairs up and down (maximum 4)			
TOTAL SCORE			**9- items score**		**/36**

Score interpretation:

- **32/36 –36/ 36 - Indicates not frail**
- **25/36 – 31/36 - Indicates mildly frail**
- **17/36 – 24/36 - Indicates moderate frail**
- <17/36 – unlikely to be able to function in the community

Section: D

Elderly mobility scale

TASK	Date			
Lying to Sitting	2 Independent 1 Needs help of 1 person 0 Needs help of 2+ people			
Sitting to Lying	2 Independent 1 Needs help of 1 person 0 Needs help of 2+ people			
Sitting to Standin	3 Independent in under 3 seconds 2 Independent in over 3 seconds 1 Needs help of 1 person 0 Needs help of 2+ people			
Standing	3 Stands without support and able to reach 2 Stands without support but needs support to reach 1 Stands but needs support 0 Stands only with physical support of another person			
Gait	3 Independent (+ / - stick) 2 Independent with frame 1 Mobile with walking aid but erratic unsafe 0 Needs physical help to walk or constant supervision			
Timed Walk (6 metres)	3 Under 15 seconds 2 16 – 30 seconds 1 Over 30 seconds 0 Unable to cover 6 metres Recorded time in seconds			
Functional Reach	4 Over 20 cm. 2 10 - 20 cm. 0 Under 10 cm. Actual reach			
		/20	/20	/20

Score interpretation:

- **14 – 20 - Independent in activity of daily living**
- **10 – 13 - Borderline independent in activity of daily living**
- Below 10 – Dependent maneuvers and requiring help with basic activity of daily living

APPENDIX II

Tailored Exercise Program:

Individually tailored exercise is define as **home based, strength and balance retaining programme,** where resistance to lower limb muscles was provided via ankle cuff weights and the programme was carried out at least three times per week in 30 minutes. The Tailored exercise program consists of warm up , flexibility exercise, balance exercise and strengthening exercise.

Warm up and Flexibility exercise:

Flexibility is the range of motion in the joints and the ability of joints to move freely.

Balance exercise:

Balance exercises can help to maintain the balance and confidence of important to prevent falls and maintain the independence.

Strengthening exercise:

Strength exercise is a type of physical exercise specializing in the use of resistance to induce muscular contraction which builds the strength, anaerobic endurance, and size of skeletal muscles.

Safety measures:

- Ensure that the chair to use is sturdy and stable. Wear comfortable clothes and supportive footwear.
- Prepare a space and have the exercise band and glass of water (for afterward) ready before to start.
- While exercising, if any experience chest pain, dizziness or severe shortness of breath, stop immediately and contact phycision (or call an ambulance if they feel very unwell and the symptoms do not go away when they stop exercising).
- If any experience pain in the joints or muscles, immediately stop the procedure and check the position and try again. If the pain persists, seek advice from the postural stability instructor.

- However, feeling the muscles working or slight muscle soreness the next day after exercise is normal and shows that the exercises are working.
- Breathe normally throughout and enjoy

The steps of tailored exercise:

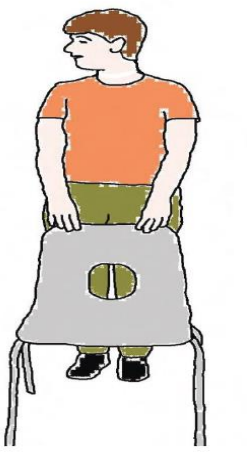
I. Warm up and flexibility exercises:

- Always begin with a warm up to prepare the body for the main exercises
- There are 6 warm up exercises

1. March:

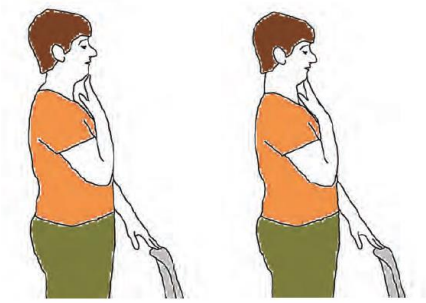
- Stand tall (holding the support if needed)
- Begin marching the legs
- If they feel steady, add an arm swing with one or both arms
- Continue marching for 1 to 2 minutes

2. Head movements:



- Stand tall with the feet hip width apart and arms resting loosely by the sides or hold the chair
- Turn the head slowly to the left then slowly to the right
- Ensure that the shoulders stay still so only the head is moving
- Repeat 5 times

3. Neck movements:



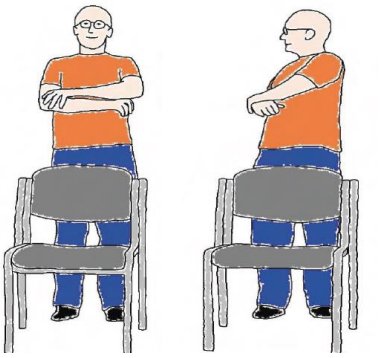
- Stand tall with the feet hip width apart and arms resting loosely by the sides or hold the chair
- Place 2 fingers on to the chin then gently guide the chin back until to feel a stretch in the back of the neck
- Repeat 5 times

4. Back extension:

- Stand tall with the feet hip width apart
- Place the hands on to the bottom
- Gently arch the back

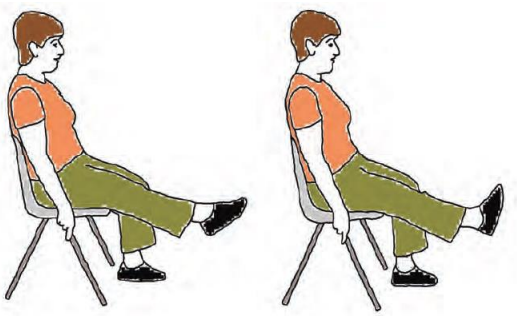
- Avoid looking at the ceiling or locking out the knees
- Repeat 5 times

5. Trunk movements:



- Stand tall with the feet hip width apart
- Fold the arms in front of the chest or place one hand on the chair
- Lengthen and lift the trunk upwards then slowly turn the head and shoulders to the right
- Ensure that are only turning the upper body (not the hips)
- Return to the start position and repeat to the other side
- Repeat 5 times

6. Ankle movements:

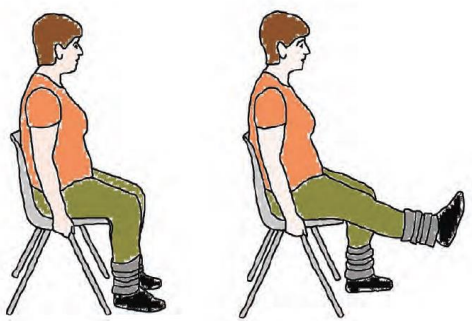


- Sit with the back supported by the chair back
- Straighten one leg so the foot is held off the floor
- Keep the leg in this position whilst pointing the toes forwards then pulling them back
- Do this 5 times then repeat on other leg
- If the pull behind the knee is too intense, perform this exercise with the foot closer to the floor

II. Strength exercises:

- There are help to improve the bone and muscle strength

1. Front knee strengthening :

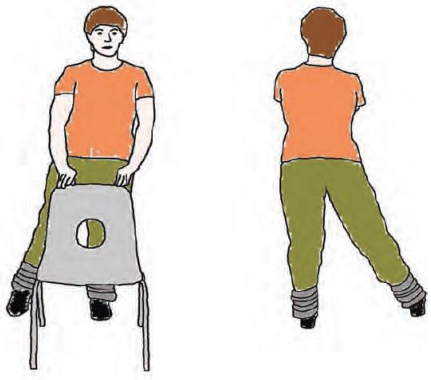


- Sit back in the chair with the back supported and the feet under the knees
- Brush one foot along the floor then lift the weight slowly and straighten (but do not lock out) the knee
- Lower the foot with control
- Repeat 5 times on one leg then change legs
- Aim to lift for a slow count of 3and lower for a slow count of 5 each time

2. Back knee strengthening:

- Stand tall close to and holding the support
- Feet hip width apart and knees soft
- Brush the foot backwards along the floor then lift the heel slowly towards the bottom
- Keep the knees close together
- Lower the foot slowly
- Place the weight back over both feet to rest briefly
- Repeat 5 times on one leg then change legs
- Aims to lift for a slow count of 3 and lower for a slow count of 5 each time

3. Side hip strengthening:



- Stand tall with the feet hip width apart holding the support
- Lift the legs slowly out to the side keeping the toes pointing forwards
- Avoid leaning the body to the side
- Lower the leg slowly
- Place the weight back over both feet to rest briefly
- Repeat 5 times on one leg then change legs
- Aim to lift for a slow count of 3 and lower for a slow count of 5 each time

4. Calf raises:

- Stand tall with the feet hip width apart holding the support
- Slowly lift the heels keeping the weight over the big toes
- Avoid locking the knees
- Lower the heels slowly
- Repeat 10 to 20 times
- Aim to lift for a slow count of 3 and lower for a slow count of 5

5. Toe raises:

- Stand tall with the feet hip width apart, holding the support
- Slowly lift the toes keeping the knees soft
- Avoid sticking the bottom out
- Lower the toes slowly
- Repeat 10 to 20 times
- Aim to lift for a slow count of 3 and lower for a slow count of 5each time

III. Balance exercises:

- There are to help improve the balance and stability and prevent falls

1. Knee bends supported:

- Feet should be hip width apart, toes facing forwards
- Hold the support
- Bend the knees and push the bottom backwards as though and were going to sit down
- Ensure the heels do not lift

- Ensure the knees do not roll inwards
- Come back up to the start position
- Repeat 3 to 5 times

2. Knee bends no support:

- Feet should be hip width apart, toes facing forwards
- Bend the knees and push the bottom backwards as though and were going to sit down
- Ensure the heels do not roll inwards
- Come back up to the start position
- Repeat 3 to 5 times

3. Toe walking supported:

- Stand side on to a support with feet hip width apart
- Lift the heels keeping the weight over the big toes
- Walk 10 steps forwards on the toes .
- Bring the feet level before lowering the heels to the floor

- Turn around towards the support then repeat the toe walking in the other direction
- Move steadily and with control

4. Toe walking no support:

- Stand with feet hip width apart
- Lift the heels keeping the weight over the big toes
- Walk 10 steps forwards to the toes
- Bring the feet level before lowering the heels to the floor
- Turn around then repeat the toe walking in the other direction
- Move steadily and with control

5. Heel toe stand supported:

- Stand tall, side on to the support
- Place one foot directly in front of the other so that the feet form a straight line
- Look ahead and balance for 10 seconds

- Take the feet back to hip width apart before placing the other foot in front and balancing for another 10 seconds

6. Heel toe stand no support:

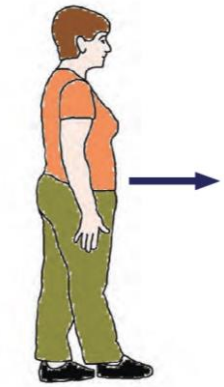
- Stand tall
- Place one foot directly in front of the other so that the feet form a straight line
- Look ahead and balance for 10 seconds
- Take the feet back to hip width apart before placing the other foot in front and balancing for another 10 seconds

7. Heel toe walking supported:

- Stand tall, side on to the support
- Walk 10 steps forwards placing one foot directly in front of the other so that the feet form a straight line
- Look ahead and aim for a steady walking action

- Take the feet back to hip width apart before turning towards the support then repeat the steps in the other direction

8. Heel toe walking toe walking no support:



- Stand tall
- Walk 10 steps forwards placing one foot directly in front of the other so that the feet form a straight line
- Look ahead and aim for a steady walking action
- Take the feet back to hip width apart before turning around then repeat steps in the other direction

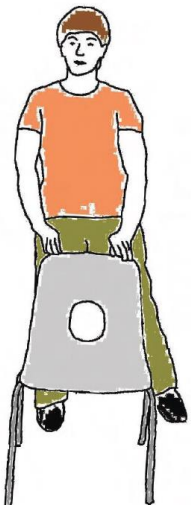
9. One leg stand supported:

- Stand close to and holding on to the support
- Balance on one leg keeping the support knee soft and upright posture
- Hold the position for 10 seconds
- Repeat on the other leg

10. One leg stand no support:

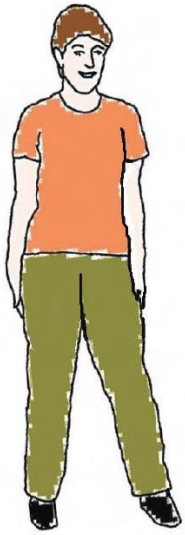
- Stand tall
- Balance on one leg keeping the support knee soft and upright
- Hold the position for 10 seconds
- Repeat on the other leg

11. Sideways walking supported:



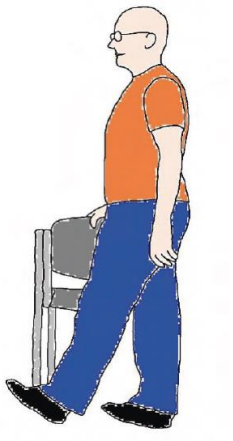
- Stand tall facing a support
- Take 10 sideways steps keeping the hips forwards and the knees soft
- Repeat the other way

12. Sideways walking no support:



- Stand tall
- Take 10 sideways steps keeping the hips forward and knees soft
- Repeat the other way

13. Heel walking supported:

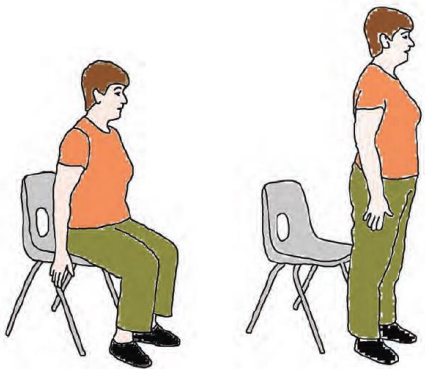


- Stand side on to the support
- Lift the toes keeping the knees soft and the bottom tucked in
- Walk 10 steps on the heels
- Move steadily and with control
- Keep looking ahead
- Bring the feet together before lowering the toes to the floor
- Repeat the other way

14. Heel walking no support:

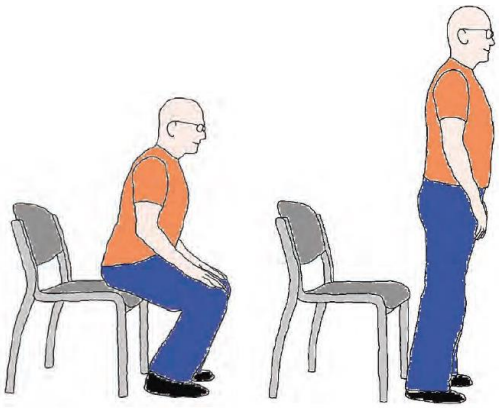
- Stand tall
- Lift the toes keeping the knees soft and the bottom tucked in
- Walk 10 steps on the heels
- Move steadily and with control
- Keep looking ahead
- Bring the feet together before lowering the toes to the floor
- Repeat the other way

15. Sit to stand using hands:



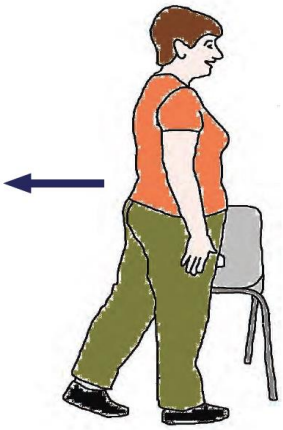
- Sit tall near the front of the chair
- Place the feet slightly back
- Lean forwards slightly
- Stand up (using the hands on the chair if needed)s
- Step back until the legs touch the chair
- Slowly lower the bottom back into the chair, reaching for the chair as the lower if needed
- Repeat 10 times

16. Sit to stand no hands:



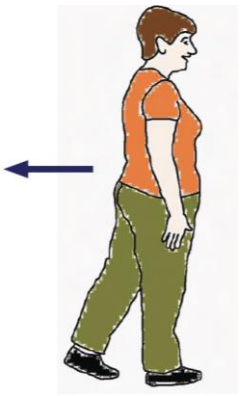
- Sit tall near the front of the chair with the hands on their thighs or folded across the chest
- Place the feet slightly back
- Lean forwards slightly
- Stand up
- Step back until the legs touch the chair then slowly lower the bottom back into the chair
- Repeat 10 times

17. Backwards walking supported:



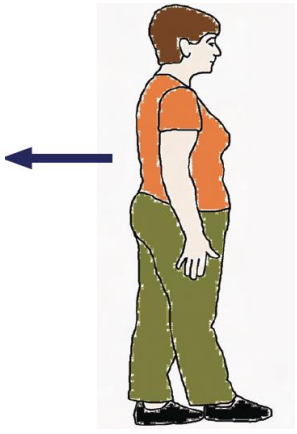
- Stand side on to the support
- Walk backwards 10 steps
- Keep the back tall and look straight ahead throughout the exercise
- Use a toe through to heel action
- Keep the pace steady and controlled
- Repeat the other way

18. Backwards walking no support:



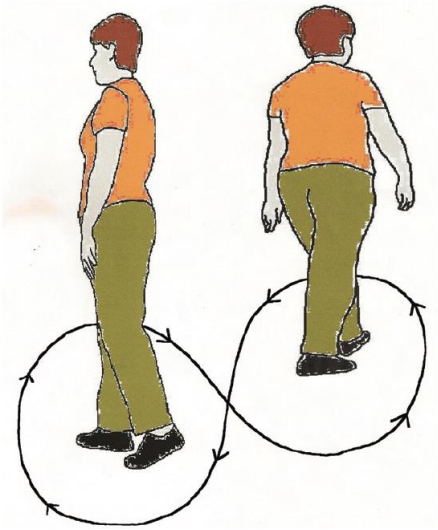
- Stand tall
- Walk backwards 10 steps
- Keep the back tall and look straight ahead throughout the exercise
- Use a toe through to heel action
- Keep the pace steady and controlled
- Repeat the other way

19. Heel toe walking backwards:



- Stand tall
- Look straight ahead
- Place one foot directly behind the other touching the toe against the heel so the feet are in a straight line
- Continue walking backwards in this way for 10 steps
- Aim for a smooth walking action, rolling through the foot from toe to heel
- Place the feet hip width apart before turning then repeat in the other direction

20. Walk and turn:



- Walk at the usual pace in a figure of 8 shape (around 2 chairs if this is easie)
- Try to maintain upright posture as their walk
- Repeat this exercise twice only

21. Stair walking:

- Hold the rail if their usually do, but try not to pull too much with the arms
- Use the strongest leg to lead on each step
- Place the foot fully on the stair
- Look down with the eyes (rather than bending forwards from the waist) to check the foot position
- At the top, take a rest then come back down leading with the weaker leg on each steps
- Repeat this exercise twice only for 4 steps

APPENDIX III

RASS ACADEMY COLLEGE OF NURSING
Approved By Govt. of TNC & INC - Affiliated with Dr. M.G.R. Medical University

Date:10.07.2017

ETHICAL COMMITTEE

The following members of the ethical committee were present at the meeting held on 10.07.2017at 2.30 pm in RASS Academy college of Nursing, Poovanthi.

CHAIR PERSON

1. Dr.Muthuselvam,B.Sc, M.B.B.S , MS
   Professor of Surgery (Retired)
   Chief Surgical Consultant – Health Net Hospital, Madurai.

DEPUTY CHAIRMAN

2. PROF.MRS.H.UMMUL HAPIPA M.Sc (N)
   Principal, RASS Academy College of Nursing , Sivagangai -630611

MEMBER SECRETARY

3. PROF. MRS.VIJAYA KAMU M.Sc (N)
   Vice Principal, RASS Academy College of Nursing , Sivagangai -630611

MEMBERS

4. PROF.MRS KARTHIHA M.SC (N)
   HOD of Community Health Nursing,
   RASS Academy College of Nursing, Poovanthi, Sivagangai Dist 630611

5. PROF.MRS. M.VISALAKSHI ,M.SC (N),
   HOD of Medical Surgical Nursing,
   RASS Academy College of Nursing, Poovanthi, Sivagangai Dist 630611.

6. ASSO.PROF.MRS.K.N.SUDHA ,M.SC (N),
   HOD of obstetrical & Gynecological Nursing,
   RASS Academy College of Nursing, Poovanthi, Sivagangai Dist 630611.

7. ASSO.PROF.MS.M.NANCY FLOMINA M.SC(N),
   HOD of Psychiatric Nursing,
   RASS Academy College of Nursing, Poovanthi, Sivagangai Dist 630611.

RASS ACADEMY COLLEGE OF NURSING
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RESOLUTION

It is resolved to accept Mrs.M.JOTHIMALAR, to conduct an experimental study to assess the effectiveness of tailored exercise program on levels of physical Performance, Mobility and falls efficacy among elderly in Poongudil old age home at poovanthi.

The institutional Ethics committee expects to be informed about the progress of the study . Any changes in protocol , patients information and ask to be provided a copy of the final report.

Yours sincerely,

Chair person
Ethics committee

Yours sincerely ,

Deputy Chairman
Ethics committee

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25, Sivagangai Road, Near Anna Bus Stand, Madurai 20. ✆ 0452 4394440, 8903012894, Email: rassacademycon@yahoo.com, Web: www.rassacademy.com

APPENDIX IV

PERMISSION LETTER TO CONDUCT THE STUDY

From

Mrs M.Jothimalar,
M.Sc(N) II year Student,
RASS Academy College of Nursing,
Poovanthi, Sivagangai District.

To

The Managing Director,
Poongudil Oldage home,
Poovanthi.

Respected Sir,

I am Mrs.M.Jothimalar, doing M.Sc(Nursing) in RASS Academy College of Nursing, Poovanthi, Sivagangai District, affiliated to the Tamilnadu Dr.MGR.Medical University, Chennai. As part of my curriculum, I am conducting a research study on the topic:

"A Study to evaluate the effectiveness of tailored exercise program on levels of physical performance, mobility and falls efficacy among elderly in Poongudil old age home Poovanthi "

The purpose of this study is to educate the effect of tailored exercise to improve the level of physical performance, mobility and to reduce falls efficacy among elderly people. I request you to grant permission.

Thanking you,

Yours Faithfully,

APPENDIX IV

LIST OF EXPERTS

1. Prof.Mrs.UMMUL HAPIPA, M.Sc (N).,
PRINCIPAL,
RASS Academy College of Nursing,
Poovanthi, Sivagangai District-630561

2. Prof. Mrs.VISALATCHI, M.Sc., (N)
RASS Academy College of Nursing,
Poovanthi, Sivagangai District

3. Dr.KALAVATHI, MBBS.,
Medical Officer
Urban Primary Health Center
Sivagangai Dist

4. Prof.Mrs.PARVATHI, M.Sc., (N)
Ramachandra Naidu College of Nursing
Perumalpatti, Rajapalayam
Thirunelvel District.

5. Dr.VARADHARAJAN, M.Sc., M.Phil., M.Ed., Ph.d(Edn).,
Professor of Statistics
RASS Academy College of Nursing.
Poovanthi, Sivagangai District**.**

6. Associate Prof. Mrs. KAVITHA.Msc., (N).,
RASS Academy College of Nursing
Poovanthi Sivagangai District

7. Assist Prof.Mrs.KARPAGAM, M.Sc.(N).,
RASS Academy College of Nursing
Poovanthi.Sivagangai Dist

APPENDIX VI

PHOTOGRAPHS